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THE ZOOLOGIST:

A

POPULAR MONTHLY MAGAZINE

OF

NATURAL HISTORY,

AND

JOURNAL FOR RECORDING FACTS AND ANECDOTES

RELATING TO

QUADRUPEDS, BIRDS, REPTILES, FISHES, MOLLUSKS,
INSECTS, WORMS, ZOOPHYTES, &c.

THEIR HABITS, FOOD, RETREATS, OCCASIONAL APPEARANCE,
MIGRATIONS, NESTS AND YOUNG.

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ON THE ZOOLOGY OF ANCIENT EUROPE :
a Paper read before the Cambridge Philosophical Society, on Monday, 31st March, 1862. By ALFRED NEWTON, M.A., Fellow of Magdalene College, Cambridge, F.L.S., F.Z.S., F.C.P.S., &c.

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August 27, 1862.

NOTICES OF NEW BOOKS.

'A Memoir of Thomas Bewick, written by himself; embellished by numerous Wood Engravings, designed and engraved by the Author for a work on British Fishes, and never before published.'

Newcastle-on-Tyne: printed by Robert Ward, Dean Street, for Jane Bewick, Gateshead. London: Longman & Co. 1862.

WHAT sweet visions arise in the eyes of the naturalist at the name of Bewick! "His works indeed are of the smallest dimensions, but this makes it only the more surprising that so much interest could be comprised within such little spaces. The woodcuts that illustrate his books of Natural History may be studied with advantage by the most ambitious votary of the highest classes of Art, filled as they are by the truest feeling for Nature, and though often representing the most ordinary subjects, yet never, in a single instance, degenerating into common-place. The charming vignettes that ornament these books abound in incidents from real life, diversified by genuine humour, as well as by the truest pathos, of which the single figure of a shipwrecked sailor saying his prayers on a rock, with the waves rising round him, is an instance. There is often in these little things a deep meaning that places his art on a level with styles which the world is apt to consider as greatly above it, in proof of which I would mention the party of boys playing at soldiers among graves, and mounted on a row of upright tombstones for horses; while for quaint humour, extracted from a very simple source, may be noticed a procession of geese which have just waddled through a stream, while their line of march is continued by a row of stepping-stones. The student of landscape can never consult the works of Bewick without improvement. The backgrounds to the figures of his quadrupeds and his birds and his vignettes have a charm of Nature quite his own. He gives us in these every season of the year, and his trees, whether in the clothing of summer or in the nakedness of winter, are the trees of an artist bred in the country. It is equally true in his little home scenes, his farm yards and cottages, as in the wild coast scenery, with the flocks of sea birds wheeling round the rocks. In one of these subjects stands a ruined church, towards which the sea has encroached, the rising tide threatening to submerge a tombstone raised 'to perpetuate the memory,' &c. Bewick resembles Hogarth in this, that his illustrations of the stories of others are not to be compared with his own inventions. His feeling for the beauties of Nature as they were impressed on him directly, and not at second-hand, is akin to the feeling of Burns, and

his own designs remind me, therefore, much more of Burns than the few he made from the poet.”*

It will be seen that the preceding sentences were penned by one in all respects able to appreciate Bewick as an artist; our business with him in the pages of the ‘*Zoologist*’ is both as artist and naturalist, and confining ourselves to this view of the greatest of wood engravers there is much in this volume that we pass by as foreign to our object. It is quite clear that this autobiography was written for the object avowed, to amuse near and dear relations, not to instruct that larger world to whom the works of the writer of right belong. These are his words, “My dear Jane,—It is in compliance with your wish that I have, after much hesitation and delay, made up my mind to give you some account of my life, as it may at a future day amuse you and your brother and sisters in your passage through the crooked as well as the pleasant paths of the world.” Thus most truthfully is the object of the work set forth, and in strict accordance with this intention is it performed throughout; and thus there are introduced faithful portraits of Bewick’s neighbours, though unconnected with him in any way, but whose history and conduct attracted his notice. Such was Anthony Liddell, a man who formed his character by the Bible, and yet was a vagabond who preferred jail to liberty, because he was better fed by the country than when he fed himself, and who treated all men as equals. Such was Thomas Forster, whose weakness, or strength as some would call it, was in bees. Such was John Chapman, who lived on bread, potatoes and oatmeal for six weeks at a time, that he might enjoy a regular drinking bout at Newcastle with his savings, which periodical treat he called “lowsening his skin.”

It is not for me to object to such scraps of biography or with the object for which they were written, but I cannot help feeling and expressing that—as the heroes in question had not the most remote connection with Thomas Bewick—I should greatly have preferred their absence to their presence in this unpretending narrative. I should have liked it all Bewick, and would gladly have been saved the trouble of picking out the scraps of Bewickian lore from a mass of extraneous information. Nevertheless these scraps are well worth the picking, and begin in very early life. Here is the first, when the little boy is condemned to learn Latin. “As I never knew for what purpose I had to learn it, and was rather wearied out in getting off long tasks, I rather flagged in this department of my education, and the margins of my

* Leslie’s ‘*Hand-book for Young Painters*.’ I am pleased to adopt without alteration such judicious praise.—*E. N.*

books and every space became filled with various kinds of devices and scenes I had met with, and these were accompanied by wretched rhymes explanatory of them. As soon as I had filled all the blank spaces in my books, I had recourse, at all spare times, to the gravestones and the floor of the church porch with a bit of chalk, to give vent to this propensity of mind, of figuring whatever I had seen. At that time I had never heard of drawing, nor did I know of any other paintings besides the King's Arms in the church, and the signs in Ovingham of the 'Black Bull,' the 'White Horse,' the 'Salmon' and the 'Hounds and Hare.' I always thought I could make a far better hunting scene than the latter; the others were beyond my hand." The schoolmaster caught the little lad at his unprofitable labour and called him a conjuror. Like the youth he had never heard of drawing, and seemed to regard the occupation as something uncanny: his father also found a great deal of fault with him for thus misspending his time. Thomas persevered nevertheless, and filled the flagstones of the floor, and especially the hearthstone, with his designs in chalk; but a friend, whose name is not recorded, saw that this propensity was not so entirely evil as the village pedagogue and the boy's father considered it, and instead of trying to exorcise the demon within him, by thrashing and scolding, actually gave him paper on which to execute his designs. "Pen and ink and the juice of the bramble-berry make a great change. These," says the writer, "were succeeded by a camel's hair pencil and shells of colours, and thus supplied I became completely set up. * * * The beasts and the birds which enlivened the beautiful scenery of the woods and wilds surrounding my native hamlet furnished me with an endless supply of subjects. I now, in the estimation of my rustic neighbours, became an eminent painter, and the walls of their houses were ornamented with an abundance of my rude productions at a very cheap rate. These chiefly consisted of particular hunting scenes, in which the portraits of the hunters, the horses, and of every dog in the park, were, in their opinion as well as my own, faithfully delineated."

Even in the church the drawing propensity found its way. "Having got off the service" he held down his head and repeated it with the rest of the congregation, all the while employing himself in drawing figures upon the soft painted book board with a pin. Flogging seems to have been the normal condition of the boy, but was wholly useless; it neither taught him Latin, cured a vagrant taste for hunting and fishing, woods and wilds, nor eradicated the propensity for drawing; so solitary confinement was tried, a system that was very irksome, as the poor boy

had at that time a firm belief "in ghosts and boggles." He says "My life, both at school and at home, might be considered a life of warfare, and punishments have been inflicted upon me apparently with little effect."

On the 1st of October, 1757, Bewick was bound apprentice to Ralph Beilby, an engraver at Newcastle, and here he first saw practised the art of engraving on wood. His master was a great bungler at his craft, but the apprentice immediately excelled him and obtained reputation accordingly. Some of the wood blocks engraved for the 'Story Teller,' 'Gay's Fables,' &c., were so much approved and admired by his master that he sent impressions of them "to be laid before the Society for the Encouragement of Arts," and these obtained a premium. "This I received shortly after I was out of my apprenticeship," writes Bewick, and it was left to my choice whether I would have it in a gold medal or money, seven guineas: I preferred the latter; and I never in my life felt greater pleasure than in presenting it to my mother."

We have a very pleasant picture some years later of Bewick's weekly visits to his parents at Cherryburn, he being then located at Newcastle. These visits were never omitted, and the only difference caused by altered season or altered weather was the enjoyment with which the young naturalist viewed the ever-varying face of the earth. Here is a description of the advent of spring. "As soon as the days began to lengthen, and the sprouting herbage had covered the ground, I often stopped with delight by the sides of woods to admire the dangling woodbine and roses, and the grasses powdered or spangled with pearly drops of dew; and also, week after week, the continued succession of plants and wild flowers. The primrose, the wild hyacinth, the harebell, the daisy, the cowslip, &c.,—these, altogether, I thought no painter ever could imitate. I had not at that time ever heard the name of the great and good Linnæus, and knew plants only by their common English names. While admiring these beautifully enamelled spots on my way, I was also charmed with the equally beautiful little songsters, which were constantly pouring out their various notes to proclaim the spring. While this exhilarating season glided on by imperceptible degrees, unfolding its blossoms till they faded into summer, and as the days lengthened, my hours of rising became more and more early. I have often thought that not one half of mankind knew anything of the beauty, the serenity and the stillness of the summer mornings in the country, nor have ever witnessed the rising sun's shining forth upon the new day."

These visits to his parents were made with the utmost regularity,

and quite irrespective of such trifling incidents as wind and rain. "I had begun betimes," he writes, "and by degrees, to habituate myself to temperance and exercise, which hardened the constitution to such a pitch that neither wet nor cold had any bad effect on me. On setting out on my weekly pedestrian flight up the Tyne, I never looked out to see whether it was a good day or a bad one; the worst that ever fell from the skies never deterred me from undertaking my journey. On setting out I always waded through the first pool I met with, and had sometimes the river to wade at the far end. I never changed my clothes, however they might be soaked with wet or stiffened by the frost, on my returning home at night, till I went to bed. I had inured myself to this hardship by always sleeping with my windows open, by which a thorough air, as well as snow, blew through my room. In this way I lay down rolled in a blanket, upon a mattress as hard as I could make it." During the whole course of this kind of life he knew not what it was to have cold or cough or rheumatism, or any of those ailments we generally suppose incidental to a life of exposure.

When out of his apprenticeship Bewick became a partner in his master's business, and we must now turn to the history of his appearance before the public. Of the origin of his 'History of Quadrupeds' he writes thus:—"Having, from the time that I was a school-boy, been displeased with most of the figures in children's books, and particularly with those of the 'Three Hundred Animals,' the figures in which, even at that time, I thought I could depicture much better; and having afterwards very often turned the matter over in my mind, of making improvements in that publication, I at last came to the determination of making the attempt. The extreme interest I had always felt in the hope of administering to the pleasure and amusement of youth, and judging, from the feelings I had experienced myself, that they would be affected in the same way I had been, whetted me up and stimulated me to proceed. In this, my only reward besides was the great pleasure I felt in imitating nature. That I should ever do anything to attract the notice of the world, in the manner that has been done, was the farthest thing in my thoughts; and so far as I was concerned myself at that time, I minded little about any self-interested considerations. These intentions I communicated to my partner; and, though he did not doubt of my being able to succeed, yet, being a cautious and thinking man, he wished to be more satisfied as to the probability of such a publication paying for the labour. On this occasion, being little acquainted with the nature of such under-

takings, we consulted Mr. Solomon Hodgson, bookseller and editor of the 'Newcastle Chronicle,' as to the probability of its success, &c., when he warmly encouraged us to proceed. Such animals as I knew, I drew from memory on the wood; others which I did not know were copied from Dr. Smellie's 'Abridgement of Buffon,' and other naturalists, and also from the animals which were from time to time exhibited in itinerant collections. Of these last I made sketches first from memory, and then corrected and finished the drawings upon the wood from a second examination of the different animals. I began this business of cutting the blocks with the figure of the dromedary, on the 15th November, 1785, the day on which my father died. I then proceeded in copying such figures as above named as I did not hope to see alive. While I was busied in drawing and cutting the figures of animals, and also in designing and engraving the vignettes, Mr. Beilby, being of a bookish or reading turn, proposed, in his evenings at home, to write or compile the descriptions. With this I had little more to do than furnishing him, in many conversations and by written memoranda, with what I knew of animals, and blotting out, in his manuscript, what was not truth. In this way we proceeded till the book was published in 1790. The greater part of these wood-cuts were drawn and engraved at night, after the day's work of the shop was over. In these evenings I frequently had the company of my friend the Rev. Richard Oliphant, who took great pleasure in seeing me work, and who occasionally read to me the sermons he had composed for the next Sunday. I was also often attended, from a similar curiosity, by my friend the Rev. Thomas Hornby, Lecturer at St. John's Church. He would not, like my friend Oliphant, adjourn to a public-house and join in a tankard of ale, but he had it sent for to my work-place. We frequently disagreed in our opinions as to religious matters, he being, as I thought, an intolerant high churchman; but notwithstanding this, he was a warm well-wisher and kind friend, and was besides of so charitable a disposition that his purse was ever open to relieve distress, and he would occasionally commission me to dispose of a guinea anonymously to persons in want."—P. 144.

Such is the account of the first publishing speculation of Thomas Bewick,—a speculation that proved eminently successful: we now come to his greatest and most important work, the 'History of British Birds:' he had long paid great attention to the subject; had learned to distinguish the species from each other; had closely observed their colour and form; had noticed and absolutely loathed the mon-

strous absurdities which bird-stuffers exhibited as the perfection of their art; and had examined all the published figures of birds, and all the histories of birds, to which he could gain access. Notwithstanding this industrious search into the labours of others, Bewick "determined to copy nothing, but to stick to nature as closely as he could." His engravings being at last finished, it became necessary to supply the letter-press; and on this subject we could have rejoiced to have found more particular information, seeing how much and how bitterly its authorship has been discussed. The first volume of the 'History of British Birds,' as well as the whole of the 'History of Quadrupeds,' were written by Mr. Bewick's partner, Mr. Ralph Beilby, assisted by the greater knowledge of fact possessed by Bewick himself: the record of this is brief, but incontrovertible. "After working many a late hour upon the cuts, the first volume of the book was at length finished at press in September, 1797. Mr. Beilby undertook the writing or compilation of this, the first volume, in which I assisted him a great deal more than I had done with the 'Quadrupeds.' After this Mr. Beilby gave up the engraving business."—P. 162. These works, therefore, produced by the two partners in business, the literary department by Beilby, the illustrations by Bewick, were of course partnership property; they became Bewick's sole property by purchase only. "Some disputes happening respecting the printing of the 'Quadrupeds,' Mr. Beilby, who now sought repose, and could not be turmoiled with disputes of any kind, sold me his share of that publication. Some time before the second volume of the 'Birds' was put to press, he also sold me his share of the first volume." This loss of his partner induced Bewick to attempt what had never before occurred to him,—to furnish the letter-press to his own illustrations. "As soon as Mr. Beilby left me," he writes, "I was obliged, from necessity, not choice, to commence author. As soon as each bird was finished on the wood, I set about describing it from my specimen, and at the same time consulted every authority I could meet with, to know what had been said; and these, together with what I knew from my own knowledge, were then compared: and in this way I finished, as truly as I could, the second volume of the 'History of British Birds.'" That Thomas Bewick was really nothing of an author will be admitted by all those who have studied the works which bear his name: his calling was that of an artist, and in his particular department of art he was altogether without a rival: as a draughtsman and engraver of wood blocks no one has ever equalled him. The texture of plumage has never been

rendered so faithfully; the scraps of country life have never been depicted so truthfully. Nevertheless, it is a great mistake to quote the supposed writings of Bewick with expressions of admiration, or to bestow unmeasured praise on descriptions of the merits and demerits of which he was equally innocent. To Mr. Beilby credit must be given for any excellencies discoverable in these volumes, and to Mr. Beilby must be assigned any blame for their numerous inaccuracies. The present volume, full of the genuine thoughts of a good and noble-minded man, is an evidence of his inability to write English clearly and forcibly; the construction of the sentences is clumsy, and the meaning not unfrequently obscure: but regarding the "Memoir" in its true light, a legacy to please and amuse his children, it is a most valuable contribution to the biography of a most worthy man.

Three chapters are devoted to wood-engraving and book-illustration generally, and are well worth the most attentive perusal; they abound in valuable instruction and hints which every engraver ought to study: the process of lowering the surface of the wood for the distances is especially deserving of notice, and should be adopted by every one who desires to attain excellence. It is, however, impossible to give these chapters entire within the limits of this Journal, and to divide or abridge them would render them almost useless.

With regard to the illustrations of this "Memoir," veneration for the name of Bewick requires that the truth must be told; they are altogether unworthy of him, and the conclusion at which every one competent to form an opinion must arrive is, that they were rejected by the artist himself as failures; many of them are poor and confused in design, most of them feeble in execution, perhaps the feebleness of age or infirmity. Some of the fishes—alas! a very few of them—must be excepted from this censure; for instance, the John Dory, p. 297, and the Lump Sucker, p. 317; but there is every reason to rejoice that the projected 'History of British Fishes' was never completed, but left for the master mind of a Yarrell, under whose guidance the wood engraver has illustrated a work which, like Bewick's 'Birds,' is equally a boon to the naturalist and a credit to the country. Nevertheless, though we may doubt the judgment, we must admire the spirit that has dictated the publication of these relics: it is as the payment of a legacy to a public by whom Bewick was beloved and admired. "Thomas Bewick gently sighed away his last breath at half-past one on the morning of the 8th November, 1828." So concludes the editor of this "Memoir." Let us add,—he was possessed of virtue, honour, integrity, perseverance, courage

and talent, that no ill-usage, temptation, difficulty or danger could ever jeopardise: a less courageous mind would have sunk under the brutality of the ignorant pedagogue who ruled the school in which his boyhood was spent: a less persevering spirit would have shrunk from the difficulties that met him at every step of his self-selected path: a less steadfast mind would have yielded to the constantly-besetting temptations to diverge from the paths of virtue, temperance and frugality. To every young man this Memoir will be instructive; to every young naturalist its teachings are invaluable. It is a photograph that represents a Bewick who is not the conventional Bewick of our imagination,—a wiser perhaps, but certainly a different, man.

E. N.

An Essay upon the Dinotherium. By S. P. SAVILLE, Esq.

It would be difficult to name any other department of Science which has undergone such decided improvement, within the last few years, as the very interesting branch of physical investigation termed Geology. Until then the secondary strata of deposits received no attention; for it was never imagined that they contained the records of various and extensive revolutions in the condition of land and water, as well as in the classes of organised beings with which our globe has been successively peopled; still less was it supposed that evidence could be deduced from the same sources illustrative of the original formation and subsequent disturbances of older rocks. When a comparison is made between what is now and has been, whether with reference to the works of external nature or the history of mankind, the desire of explaining what is obscure in the past supplies an additional motive to examine a multitude of facts, within the reach of our own observation, with more minute accuracy, and to generalize them with more comprehensive views. Geology is continually concerned in such comparisons. By prompting us to investigate more in detail both the animate and inanimate kingdoms of nature, it has enlarged these departments of study, and revealed a multitude of new phenomena connected with them: it has even done more than this; it has elevated their rank and dignity, by teaching us the laws of the aggregation and distribution of simple minerals, and by requiring more comprehensive systems for the arrangement of the animal and vegetable productions of the earth. This latter branch of Science has engaged the energies of many powerful minds, from the days of Linnaeus to our own times.

M. Cuvier, in his Preface to the 'Règne Animal,' justly remarks that "the habit necessarily derived from the study of Natural History, of classing in the mind a great number of ideas, is one of the advantages derived from this science, the least talked of, but which may rank perhaps as the principal, when it shall have been generally introduced into ordinary education. In addition to these advantages derived from the study of Natural History, Geology has the merit of exerting continually the reasoning faculties, in deducing conclusions from numerous data and complicated phenomena, and, although it cannot appeal to demonstrative proof, may often conduct us to moral certainty. It is constantly concerned in weighing a great mass of probable evidence, and is therefore powerfully instrumental in exercising the mind and strengthening the judgment.

In regard to organic fossil remains, we have hitherto been acquainted with very few mammiferous quadrupeds as natives of the British Islands, or as having inhabited them within twenty-three generations. We have now discovered that this part of the earth was once peopled by many other animals of the same class, although we have not yet penetrated beyond the first boundaries of this new region of discovery.

It is admitted by all naturalists that the animals of our own acquaintance are not mere varieties of fossil species gradually changed by climate and other local circumstances; and further, that the probability is extremely remote of discovering even a small proportion of the supposed extinct quadrupeds, in a living state, in regions hitherto unexplored. Surprising as the above facts may appear, there are others, relating to the same department of the animal kingdom, which attest far greater changes in the form of the land and the ancient character of its inhabitants. At a yet earlier epoch that part of the globe where the continent of Europe now extends was peopled with a race of terrestrial quadrupeds of an entirely different description,—a race of which most of the genera, and all the species known to us as fossil remains, have been since annihilated. Their skeletons are found entombed in strata evidently deposited in the entrances of rivers and at the bottom of fresh-water lakes, in a manner closely analogous to strata at present in the course of formation in our own lakes and rivers. In the same formation are found the bones of birds and crocodiles, fresh-water tortoises and fish; nor are shells wanting. The whole of these are either of extinct genera or of unknown species. The plants on which these large herbivorous animals were supported differed as widely as them-

selves from all known species. Palms, reeds, and many other kinds are met with in these strata, indicating upon the whole a vegetation not exactly of tropical climates, as does the flora of our secondary formations, but rather such as now clothes the countries bordering on the Mediterranean. But what is most important as regards these quadrupeds is the circumstance that in the environs of Paris and in those of Orleans, and in a district not far from the Rhine, near Strasburg, the strata enclosing them are again covered with marine deposits.

After a careful examination of the contents of these, there admits no doubt that the sea returned and covered the land on which these animals had lived, and where the rivers and lakes were situated, in the beds of which their remains had been buried. To such an event the most celebrated geologists of the day have, with great probability, attributed the annihilation of the quadrupeds then inhabiting the ancient continents.

Deluges and earthquakes have operated, at different intervals of time, to destroy the productions of Nature and Art, which modern industry has clearly developed; but geologists have extended their exertions, and have shown how much of the history of extinct races may yet be rescued from oblivion. The *Dinotherium*, together with the *Megatherium*, constitute perhaps the most remarkable of all fossil Mammalia in regard to size, and unexampled peculiarities of anatomical construction, with which modern discovery is acquainted. The *Dinotherium* is the largest of all land creatures belonging to that class of animals which suckle their young, whilst the *Megatherium* presents greater deviations from ordinary animal forms than occur in any other species, either of recent or fossil quadrupeds.

The second or miocene system of tertiary deposits contains an abundance of the extinct genera of lacustrine (inhabiting lakes) Mammalia, with the earliest forms of genera, which exist at the present time. These admixtures have been found in great abundance at Epplesheim, near Alzey, about twelve leagues south of Mayence; and splendid specimens are preserved in the museum of Darmstadt. Among all these remains of animals, which it is unnecessary here to particularize, further than that they embrace numerous important specimens, no vestiges of the monkey tribe have been discovered, until lately, in the department of Gers, in France, a single jaw-bone of one of these animals was found among other skeletons of extinct quadrupeds.

No traces of man or his works have hitherto been discovered in any of these strata which can distinctly claim a remote antiquity

corresponding to that of the extinct species of quadrupeds. But, however, supposing that man was contemporary with the animals of the older strata, there are several causes which would account for the absence of all trace of him. In his early condition his numbers must have been infinitely small compared to the rest of the animal creation, and therefore the chance of the discovery of his remains is as one to many thousands. Man was, further, long confined to a certain limited spot on the earth's surface, while the animal creation, it is presumed, was universally diffused; so that the extensive forests and wild savannahs swarmed with live existences, although no human eye and intelligence were there to behold their habits and motions.

The regions most minutely examined by geologists—such as England, France, Germany, &c.—were evidently long under the ocean, and many of the animals discovered in this deposit indicate a lacustrine or swampy condition of the regions they inhabit; one of the most remarkable and extraordinary, the *Dinotherium giganteum* (gigantic tapir), it is now our object to describe.

The excellent publications of Professor Kaup, of Hesse Darmstadt, having given it as the opinion of that learned author that the fossil animal holds an intermediate space between the tapir and the mastodon, whilst the eminent Cuvier—from the molar teeth it possesses nearly resembling those of the tapir—seems inclined to refer it to a gigantic species of that genus. The talented geologist, Mr. Bakewell, possesses in his museum a remarkable specimen, exhibiting the crown of the teeth of this animal. It was found with other mammalian remains near Grenoble, and from the hardness and brilliance of the enamel it appears as fresh as if recent. He considers it the most perfect fossil tooth he has ever seen. The form of these molar teeth approaches most nearly to those of tapirs; but there is a marked difference from the character of those animals as well as of every other quadruped, whether living or extinct; it consists in the presence of two enormous tusks placed at the anterior extremity of the lower jaw, and curved downwards similar to the tusks in the upper jaw of the walrus.

The largest species of this genus is estimated, both by Cuvier and Kaup, to have attained the extraordinary length of eighteen feet. The most wonderful bone that has yet been discovered is the shoulder-blade, the form of which more nearly resembles that of a mole than any other animal, and seems to indicate a peculiar adaptation of the fore-leg for the purposes of digging—an idea which receives strength on viewing the remarkable structure of the lower jaw: the length of this jaw, including the tusk, has been estimated at nearly four feet: it

belongs to the tribe of the *Pachydermata*, or thick-skinned animals, and its frequent haunts were marshy grounds or the estuaries of rivers; but its most important peculiarity is in the position of the tusks, which remarkably tends to illustrate the habits of the animal. From the near approximation to the living tapir, we may infer that it was furnished with a proboscis, by means of which it conveyed to its mouth the food it raked from the bottoms of lakes and rivers by its tusks and claws. The bifid ungual bone (the two-railed) discovered with the other remains of the *Dinotherium*, having this remarkable bifurcation, which is found in no living quadrupeds except the pangolins, seems to have possessed a claw like that of these animals, possessing peculiar advantages for the purposes of digging and scraping, and indicating functions concurrent with those of the tusks and scapula.

In reference to this position of the tusks, constituting the great peculiarity of the animal, Dr. Buckland has happily alluded, in closing his account of it. We cite the learned Professor's own language:—"It is mechanically impossible that a lower jaw nearly four feet long, loaded with such heavy tusks at its extremity, could have been otherwise than cumbrous and inconvenient to a quadruped living on dry land. No such disadvantage would have attended this structure in a large animal destined to live in water; and the aquatic habits of tapirs, to which the *Dinotherium* was most nearly allied, render it probable that, like them, it was an inhabitant of fresh-water lakes and rivers. To an animal of such habits the weight of the tusks sustained in water would have been no source of inconvenience, and if we suppose them to have been employed as instruments for raking and grubbing up the roots of large aquatic vegetables from the bottom, they would under such service combine the mechanical powers of the pickaxe with those of the horse-harrow of modern husbandry. The weight of the head, placed above those downward tusks, would add to their efficiency for the service here supposed, as the power of the harrow is increased by being loaded with weights. The tusks of the *Dinotherium* may also have been applied with mechanical advantage to hook on the head of the animal to the banks, with the nostrils sustained above the water, so as to breathe securely during sleep, whilst the body remained floating at perfect ease beneath the surface; the animal might thus repose, moored to the margin of the lake or river, without the slightest muscular exertion, the weight of the head and body tending to fix and keep the tusks fast anchored in the substance of the bank, as the weight of the body of a sleeping bird keeps the claws firmly round the perch. These tusks might have been further

used, like those in the upper jaw of the walrus, to assist in dragging the body out of the water, and also as formidable instruments of defence. The structure of the scapula, already noticed, seems to show that the fore leg was adapted to co-operate with the tusks and teeth in digging and separating large vegetables from the bottom. The great length attributed to the body would have been no way inconvenient to an animal living in the water, but attended with mechanical disadvantages to so weighty a quadruped upon land. In all these characters of gigantic herbivorous aquatic quadrupeds we recognise adaptation to the lacustrine condition of the earth during that portion of the tertiary periods to which the existence of these seemingly anomalous creatures appear to have been limited."

It would hence appear that successive races of distinct plants and animals have inhabited the earth—a phenomenon perhaps not more unaccountable than one with which we are familiar, that successive generations of living species perish, some after a brief existence of a few hours, others after a protracted life of many centuries. None of these fossil plants or animals appear referable to species now in being, with the exception of a few imbedded in the most recent strata, yet they all belong to genera, families or orders, established for the classification of living organic productions; they even supply links in the chain, without which our knowledge of the existing systems would be comparatively imperfect. It is therefore clear to demonstration that all, at whatever distance of time created, are parts of one concentrated plan. They have all proceeded from the same author, and bear indelibly impressed upon them the marks of having been designed by one mind. There is a gradation of animated beings, from those of the most complicated organization,—from the invertebrated to the vertebrated; and, ascending in the scale, from the lowest of the vertebrated class to the most perfect, we find at length in the *Mammalia* all the most striking characters of osteological structure, and all the leading physiology of the human frame fully displayed. When we have ascertained that animals of that class in which the type of our physical organization is so unequivocally developed, existed at distant, though not the most remote, periods in the history of this planet, and that a scheme, of which man forms an inseparable part, is of such high antiquity, the remarks of Bishop Butler on the connexion of the course of things which came within our view, with the past, the present and the future, are forcibly recalled to our recollection. "We are placed," he observes, "in the middle of a scheme,—not a fixed, but a progressive one,—every way incomprehensible, in a manner

equally with respect to what has been, what now is, and what shall be hereafter.

S. P. SAVILLE.

Dover House, Cambridge,
July 14, 1862.

Note on the Breeding of the Honey Buzzard in the New Forest.—I took a nest of two eggs of this rare bird on the 21st of June, 1859, and the female bird was shot as she rose from the nest. The nest was placed in a fork of an oak tree, not more than twenty-five or thirty feet from the ground. I was informed by the gamekeeper that, two or three years before, the nest was a crow's, but on his shooting the rightful owner a pair of buzzards took to the nest, and had repaired it from year to year since. At the time I took the eggs the bottom part appeared very old, but had been repaired and lined with fresh green leaves of oak and beech. The old bird, on leaving the nest, went off very much in the style of a heron, and with the same heavy flapping sort of flight. On the hen bird being shot, the male, who was flying over the trees in the immediate neighbourhood, rose to a great height in the air, and kept hovering and flying round in circles, uttering a loud note similar to the common buzzard, but somewhat hoarser. I obtained another pair of eggs in the same month and year. Last year I obtained another pair, and this year I have five eggs, three from one nest, and two from the other. The three eggs were taken at intervals of three days between each; the first, a large and fine coloured, though rather pale egg, was taken on the 7th of June; the next, a smaller and darker egg, on the 10th; and the third, a very small and peculiarly coloured egg, on the 13th. The nest of two eggs were taken on the 17th of June, and are very dark and similar in shape to those of the peregrine; and since my return home Mr. J. R. Wise has obtained two pairs of eggs, which he has sent me, together with an egg of the merlin, to blow for him.—*W. Farren; Cambridge.*

Note on the Breeding of the Merlin in the New Forest.—In 1859 I obtained a nest of three eggs, which I supposed to be the merlin's. From their size and colour, and from their being taken on the top of a low pollard holly, Mr. F. Bond, to whom I showed them, agreed with me in believing them to be the eggs of the merlin. In 1861 I obtained three or four nests of the same kind of eggs, and from similar situations, but could get no proof till the present year, when, on the 19th of May, I got a nest of three eggs, and shot the old male bird as he rose from the nest; thus not only obtaining proof of the breeding of the merlin in the New Forest, but also that the male bird takes his turn in sitting on the eggs. The eggs are very similar to some small varieties of the kestrel's, but are not so highly coloured and are nearly round: the nest was placed in a hole in a dead yew tree, and was composed of dead sticks with some sprigs of heath. All the nests I have met with were placed on low isolated trees, such as pollard hollies and hawthorns, and never in the thick-wooded part. I may mention that from but one nest have I obtained more than three eggs, and in that instance four eggs. This, I believe, is the first authentic instance of the merlin breeding in the New Forest. That the merlin should build in holes of trees has excited some surprise, as I believe it nests only on the ground in the North.—*W. Farren.*

Note on the Breeding of the Dartford Warbler in the New Forest.—I had a nest of four eggs of this bird brought to me, which were taken at the bottom of a furze bush, on the 29th of April, on Lyndhurst Heath. The eggs are similar to those of the whitethroat, but are easily distinguishable by the general appearance: the ground colour is a light gray, neatly covered with bluish and stone-coloured specks. The egg is, moreover, smaller than those of the whitethroat. The nest is very compact, and is composed of moss, fragments of heath and furze, with a few bents, lined with a little horse-hair and very fine grass; the outside of the nest is bound round with a very broad flag-like grass, which gives it somewhat the appearance, externally, of the nest of Savi's warbler. The Dartford warbler was much more plentiful in the New Forest in 1858 and 1859 than in 1861 and this year; in fact, I did not see half-a-dozen birds this year where there were dozens in the two first-named years. I believe the diminution of numbers is owing to the wet and cold summer of 1860 and the severe winter of 1860-61. I was unable to blow more than two of the above-named eggs, as they were very hard-set.—*W. Farren.*

Dates of Arrival and Nesting of Birds.—In the 'Zoologist' for June (Zool. 8026) is given the dates of arrival of the swallow, &c., in the South; the following are a few memoranda I have made down here:—

March 1. Saw first wheatear; also a tawny bunting, nearly all white; it was very tame.

April 8. Heard chiffchaff.

April 10. Saw last woodcock, and got the eggs of common wood owl.

April 13. Found the nest of missel thrush with eggs, also that of the longeared owl; the young well feathered and almost able to fly.

April 18. Found the nests of peewit and common snipe, both with four eggs; also saw a flock of fieldfares, thirty-three in number,—the latest I have seen them here was in 1855, on the 29th of April.

April 20. Saw first wood wren.

April 22. Saw first house martins.

April 26. Saw first chimney swallow, whinchat and cuckoo, and heard landrail.

April 27. Found yellow bunting's nest with three eggs.

May 4. Found curlew with four eggs, also longeared owl with two eggs, and wheatear with six.

May 17. Found a red grouse with six eggs, also a brood of young ones, running strong; same day, found a curlew with four eggs; the old bird sat on the nest till a friend and I walked within two yards of it: I never heard of a curlew sitting so close before.

May 28. Found a teal with nine eggs.

Landrails have been very plentiful this season: an old bird was killed on its nest, and two eggs broken with a scythe, on the 2nd of July. I received the remaining eight eggs, which were far from hatching. In 1854 and 1858 I saw house swallows and martins earlier than usual,—viz. on the 14th of April.—*Thomas Thompson; Winton.*

The Nest of the Nightingale.—Living in a neighbourhood abounding in these birds, I have had considerable opportunities of observing their habits. This year I have known nine of their nests, last year six: they were placed in all sorts of situations; in the bottoms of hedges, among nettles, the remains of last year's brambles, on and at the sides of ivied stumps, amongst grass and dead leaves in a wood, dense

tangles of bramble, and, in one instance *only*, at more than a foot from the ground, in a wild rose. Besides its being a very unusual thing to find the nest high up in a hedge (where thorns are most numerous), the bottom is, as a rule, nearly an inch thick, and very closely packed with dead leaves, bass and the dried stems of leguminous plants, through all which it would require a very long thorn to reach. I am afraid Shakspeare is not much of an authority in Ornithology; take, for example, the following lines on the cuckoo, where the fool in King Lear says:—

“The hedgesparrow fed the cuckoo so long,
That it had its head bit off by its young.”

There is a similar allusion in the play of Henry IV. As also it is the cock bird that sings and the hen that sits, the various lines quoted by your correspondent can be no argument for the thorn *in the nest itself*. I see the birds singing almost daily throughout May, and it is a very exceptional thing, even when there may be very tall overgrown hedges, to find them there; they will choose in preference a hazel, birch or other low-spreading bush or young tree. I once found a nest every egg in which was different, beginning with very dark blue with black spots, and going through slighter and slighter varieties till the one last laid was of the usual olive-brown colour.—*John W. Ford; Enfield Old Park, July 21, 1862.*

The Nightingale at Manchester.—“The readers of the ‘Zoologist’ have most likely read the account of an extraordinary appearance of nightingales near Manchester: this, if true, is very uncommon,” says your talented correspondent H. W. Newman (Zool. 8090). I should say so too; but I question its truth. In 1852 there was a nightingale heard in the Vale of Crumpsall, near Manchester, and great numbers of persons went to hear it. The little songster sang without intermission during the summer nights, and its song could be heard in any part of the Harpurhey Cemetery, and upon the hill sides both on the Harpurhey and Crumpsall side of the river Esk. I and a Manchester naturalist were at some trouble to ascertain what the songster was, and several times followed the sound to the edge of a large reservoir, belonging to a paper-mill, and amongst the reeds and flags which grew in it the songster, without a doubt, was singing, and we both were convinced that the bird was a reed warbler (*Salicaria arundinacea*). The inhabitants of a village near Hull once were possessed of a nightingale, and many people went to hear it; but, in this case, a naturalist from Hull succeeded in finding the nest of a reed warbler, and the bird having lost its nest, and being disturbed by the rude assemblies, forsook the place. I have no doubt but the Manchester nightingales are either reed warblers or sedge warblers, both of which will sing through the long summer nights. The reed warbler is a very fine songster, and the stillness of the summer nights renders its song doubly sweet. The sedge warbler is very common on some parts of the Ouse, and in this neighbourhood, amongst the willows that skirt the banks of the many brooks and rivulets.—*John Ranson; York.*

[I very much incline to concur in this opinion, having been often astonished at the great mistakes made as to the song of the nightingale.—*E. Newman.*]

Singular Variety of the Chaffinch's Eggs.—A correspondent (Zool. 8391) describes a variety of the chaffinch's egg, and wishes to know if such a variety is of common occurrence. For his information I beg to state that on the 29th of April, 1861, I took a nest of the chaffinch containing three eggs, which exactly agree with the description he gives, being pale blue without spots; the blue, however, not so bright as in the

redstart's egg, to which he compares his own specimens, but about the same tint as those of the wheatear. The nest, placed in a thorn bush, was much the same as usual, except that, instead of the usual dark-coloured horse-hair for lining, in this case it was white, and there was perhaps rather more white wool used in the nest than is generally seen. This induces me to ask whether the colour of the substance on which the eggs are deposited can in any way affect the colour of the eggs? On the 12th of May this year I had two more eggs of the chaffinch brought to me, exactly the same as regards the ground colour, but differing in having a few minute specks at the larger end: and I recollect taking a nest in Somersetshire, about four years ago, which contained very light-coloured eggs without spots. In addition to these instances of the variety, my friend and neighbour, Mr. Bond, has some eggs of the same description in his collection, so that I think your correspondent, Mr. Danford, must not think them of "rare occurrence."—*J. E. Harting; Kingsbury, Middlesex, July 23, 1862.*

Nesting of the Tree Creeper.—I found a nest of this bird in a wood hen-house on the 13th of June: it was about five feet from the ground, placed between the corner post and the boards, the nest very much compressed, but containing four young birds. I saw the parent birds feed them six times within five minutes; they flew to the bottom of the house, then crept up to an aperture in the boards to feed their young, and made their exit at another aperture.—*Thomas Brunton; Methven Castle, Perth, N.B.; June 30, 1862.*

Occurrence of the Hoopoe at Keynsham.—A fine specimen of a male hoopoe was shot, a few weeks ago, by Mr. Harford Syne, of the Manor House, in this parish. It was seen feeding on a heap of mixed manure near his residence. As it appears to be a rare bird in this part of the country I thought it might be worthy of notice in the 'Zoologist.'—*John Rutter; Keynsham, July 17, 1862.*

Migration of Swallows, &c.—First swallow (*Hirundo rustica*) observed on the 4th of April: I saw two or three more a few days later. I noticed a yellow wood wren in my garden on the 30th of March, and a redstart (*Sylvia phœnicurus*) and a wheatear on the 20th of April; however, the latter, I find, had been seen on the sea-cliffs about a week earlier. On the 8th of April brown linnets were still flying in flocks.—*Henry Hadfield; Ventnor, Isle of Wight, April 23, 1862.*

Notes about Magpies.—During the last two years I have kept several magpies, a rook, a Royston crow, a jackdaw, a raven, and a pair of the common gull, running about my garden, which is walled all round. Their wings have of course been kept cut. The magpies, originally three,—called Faith, Hope and Charity,—were increased to seven by the addition of Scrub, Snob, Snap and Snip. Of these, however, three have come to untimely ends; so that my present number is only four. Perhaps one or two notes about the habits of this family may be interesting. Faith, the first which came, was in many respects a very interesting bird. She was quite tame, and would whistle, bark and talk to perfection. In order to excite these performances perfect quietude and solitude were necessary: if any one was in sight the talking ceased. Early in the morning, perched in a holly tree near our bed-room window, many strange conversations were carried on; these were generally imitations of words she had frequently heard used, but were spoken with perfect distinctness. The whistle was varied in its tone and rhythm almost *ad libitum*, and very curious notes were sometimes heard. The bark is a loud, sudden expletive, generally expressive of anger, and, being something similar to the bark of a dog, we always called it barking. I have said that Faith was very tame. To those whom she knew she was very

accessible, permitting herself to be stroked on the head, which pleased her vastly, and generally elicited a low muttering vote of thanks. She would jump on to my knee or shoulder when sitting in the garden, but was easily alarmed, and, once having been caught when so doing, for the purpose of having her wing cut, it was a long time before she came again. The presence of strangers excited her greatest curiosity. After barking for some time she would gradually try to get on better terms, and was at once subdued by the jingling of a bunch of keys or the exhibition of anything shining. The presence of children, however, excited her utmost indignation, and, having enlisted Hope (the next bird to be described) into her service, she would fly at their feet, and if naked get hold of the skin, exciting the utmost terror among very young "bairns." It was this singular propensity which made the gentleman who formerly owned her transfer her to my care. Faith remained in my possession a year and a half. To my horror and vexation she was one day found dead on the garden wall, with a hole in her body, entering behind and passing right through the heart. No bullet was discovered, but I have no doubt she fell a victim to the cruel brutality of those who think it a great feat of skill to shoot down even tame and innocent birds. Hope, also now numbered with the dead, was a remarkable bird. He had evidently been brought up in the neighbourhood of or in company with the common peewit plover, whose whistle he imitated exactly, and which performance gave him in my household the *soubriquet* of Whistler. Among his other qualities Hope had a remarkable propensity to wander out of the garden. Although his wing was cut, he would make extraordinary jumps from shrubs, or get on the top of the wall by the fruit trees. When there he chose to wander about the next garden, also walled in, and commit all sorts of depredations among newly-planted things, exciting the ire and wrath of my neighbour's gardener. There is a Scotch fir tree at the corner of one of the walks, in which Mr. Hope would quietly ensconce himself, knowing full well that his wandering would soon be looked to. At the bottom of this tree was a stack of faggots, among which, when pursued, he would creep, and thus avoid capture for the time. When missed from the garden, a search was of course immediately instituted, and Mr. Hope's whereabouts was generally announced by a long whistle of defiance, from the thick part of the fir tree, the moment he saw the well-known gauze net which was usually the means of catching him. Nothing could be more provoking. Pursuit was useless so long as his means of retreat were not cut off. If, however, my servant could get round unobserved, so as to get between the tree and the faggots, capture was certain. Whistler knew this as well as we did, and generally kept a sharp, close watch, announcing, wherever we were, his discovery of the enemy by his defiant whistle. When his retreat, however, was intercepted, he knew resistance was useless, and generally hopped down on to the stubble and thence into the garden. Hope was (alas! I speak in the past tense) a very amusing bird. He had the same dislike to children as Faith, and joined with her, as before stated, in determined raids against them whenever they appeared. Mr. Hope had his likes and dislikes. The latter he always evinced most unmistakeably against the footman, who caught him in his wanderings. The former were equally shown, in the opposite direction, by the affection he evinced towards the housemaid. He would almost scream with delight when she went into the garden, and would strut about, with his crest and tail erect, in a most ludicrous manner. He would permit any amount of liberty to be taken with him in this direction. He would let her stroke his head or take him up in her arms without a struggle, and if he heard her voice in the room above sure enough he would be found

on the top of a lilac tree which commands one of the rooms, looking out for recognition. Poor Hope! he is also gone, and his death was doubly grievous, inasmuch as it was the dark deed of a young puppy which, on the point of being entirely broken in to magpies, committed the deed. Brownie was of course well flogged every day, with the dead bird before his eyes, for a week; and I will be bound to say he will never again, to the day of his death, injure another feather. Scrub is the next of my pets that deserves notice, inasmuch as I am inditing obituaries, and this is the last I have to record. Scrub came to me in a vile condition of feather and flesh, from neglect and confinement. He was turned out among the rest, and very soon picked up meat and plumage. As he grew in strength and stature, so did he increase in power over the others. He was the bully of the family, and very soon evinced his power by lording it over them all. He was withal a shy, cunning fellow, and had always an eye to his own interest. His vocal powers, however, consisted principally in imitating to perfection the cackling of a hen: so earnestly would he do this that I have listened to him with doubting ears myself; I never heard any imitation so perfect. He was deficient, however, in social qualities, and never became very tame. His death was in this wise:—A patient and kind officer in the Highlands of Scotland was good enough to send me a pinioned peregrine falcon which he had brought down when shooting grouse. I kept him at first in an out-house, which I suppose was damp, for one morning, to my horror, I discovered the poor falcon unable to stand, and paralysed in both legs. I brought him into the garden and placed him in the sun, going immediately in search of a coop. I returned just in time to save his life, for I found Scrub mounted on his back, and hammering away at his head with his beak. The poor peregrine was quite helpless, and would have been brained in no time had I not returned. Of course I expressed my indignation, and Snob was glad enough to escape with a whole skin to the top of a *lignum vite* tree, where he remained barking and scolding while I secured the falcon under the coop. Exposed to the sun and air, and well supplied with bird-food, the falcon gradually recovered; but to my surprise I found that Snob had upon more than one occasion got through the bars of the coop to steal the remains of peregrine's dinner. It did not, however, again venture to attack the latter, and the day of retribution for its own temerity was at hand. The falcon got quite well and strong upon its legs, a fact Scrub did not fully estimate, for one day, hearing a great chatter in that part of the garden, I went down just in time to see the end of a meal which peregrine was then making, the subject being the unhappy and unfortunate Scrub.—*C. R. Bree; Colchester, August 10, 1862.*

Deposition of Eggs by the Cuckoo. By H. L. SAXBY, Esq.

THE observations made by Mr. Hogan (Zool. 7935) upon this highly interesting question, together with the passage quoted by him in support of his views, are so conclusive that, but for his invitation to other ornithologists, further remark might be considered almost unnecessary. However, as I have devoted much time, during the past fifteen years, to the study of the habits of the cuckoo, and have upon the whole been somewhat fortunate in the opportunities of

observing it which have fallen to my lot, it may not be considered out of place for me here to record some of the results of my experience; and first I will relate two incidents which appear to bear strongly upon the contested point.

One morning early in June, 1855, as I was "birdsnesting" at Tan-y-Bwlch, in North Wales, I was accosted by a lad belonging to a neighbouring village, who greatly excited my curiosity by the announcement that he had just shot a hawk carrying a lark's egg in its throat, and thereupon he produced—not a hawk, but a fine specimen of a female cuckoo. He stated that the egg had dropped from the throat of the bird as he laid it upon the ground, after having carried it for some distance; and at my request he led me to a spot beside a footpath, where, after a slight search, we found a broken cuckoo's egg, and where, in still further corroboration of his story, I noticed the disturbed appearance of the grass upon which he had been resting. Now, although it must be confessed that the lad was by no means celebrated for his adherence to the truth when a falsehood would better serve his purpose, yet it would be unreasonable to suppose that in the present instance the main facts were incorrectly stated; however, as a still further test, I concealed my knowledge of the species of the bird, and then, after having conversed for some time upon other subjects, carelessly inquired what a cuckoo was like, and whether he had ever shot one. His reply convinced me that, however accurate his knowledge of game birds might be, he was utterly unaware of the fact that he was at that moment carrying a cuckoo in his hand. As nearly as could be ascertained, the bird was killed at about eleven o'clock in the morning. In the stomach were a few caterpillars and small beetles, and the ovary contained several eggs in various stages of advancement towards maturity, but none were perfect.

The second instance referred to took place in the summer of 1860, near Falkirk. I was walking beside a thick hedge about five o'clock in the afternoon, when a female cuckoo flew out of some brambles and tangled weeds at the bottom, but immediately fell to the walking-stick gun of a friend of mine who accompanied me, but who, I am desired to observe, was at the moment ignorant of the species to which the poor bird belonged. We hastened up, and within an inch of the bird's bill we found its egg, uninjured and perfectly fresh. I at once expressed my joy at having at length detected a cuckoo in the very act of carrying its egg in its bill; but here my friend very reasonably observed, that although the evidence was strongly in

favour of this supposition, yet it should be borne in mind that the bird had remained tumbling about upon the ground for some seconds after it fell, and therefore that the egg might possibly have been laid during the struggle. After having searched the hedge without finding a nest of any description, we held a *post mortem* upon the body of our unfortunate victim, which resulted in the discovery of a *perfect egg* in the oviduct; but to this remarkable circumstance I shall presently have occasion to revert.

One striking peculiarity in the history of the cuckoo appears to have met with but little attention, *viz.*, that it differs from other birds as to the *time* at which it deposits its egg in the nest: of course I do not refer to birds in a state of domestication. Careful observation of twenty different species of our insessorial birds has enabled me to ascertain the fact that, as a general rule, they lay their eggs between the hours of seven and twelve P.M., whereas those of the cuckoo are usually, perhaps invariably, placed in the nest during the daytime. Now, although it is perfectly justifiable to suppose that the cuckoo, like other birds, possesses the power of retaining an egg for a considerable time after it is ready for exclusion, and therefore that, instead of laying at night, it postpones the process until a suitable repository is found, yet that period must have its limit. And here it may well be asked, What is the consequence when no such opportunity occurs, and Nature will no longer permit the delay? Any other bird thus circumstanced would lay in its unfinished nest; but it would be difficult to imagine that the cuckoo, which is so pre-eminently subject to the inconvenience in question, should be the only bird whose requirements in this respect are unprovided for; therefore it is far from unreasonable to infer that some special provision is made to meet the emergency. The numerous observations which have from time to time appeared in the pages of the 'Zoologist' and elsewhere, go very far to substantiate the theory that when the cuckoo can no longer retain its egg the latter is laid in some convenient place, and there remains until the parent removes it, having at length found a nest for its reception; and that this is not merely a conjectural view of the case the following will, I think, pretty clearly prove.

Several years ago, about four o'clock one afternoon in June, my brother Gordon came in haste to inform me that he had just driven from a meadow pipit's nest a cuckoo, which had turned out an egg and two newly-hatched young birds, one egg only remaining undisturbed; but upon accompanying him to the spot, I was not a little

astonished to find a cuckoo's egg also in the nest. As my brother could not have been absent more than two or three minutes at the very outside, we of course immediately remarked the rapidity with which the process of laying had taken place; but our suspicions as to the mode in which the egg had been conveyed gave way to certainty upon the discovery being made that *it was nearly cold*, while that of the pipit was still quite warm. Now, even supposing that the cuckoo returned to the nest immediately after my brother left, is it at all probable that a newly-laid egg could have fallen to such a low temperature in so short a time, and if so, how was it that the pipit's egg did not also cool? I was at first rather inclined to give attention to the fact that the latter contained a living bird, and in order to satisfy myself upon the subject I that very evening procured a newly-laid hen's egg, and one that was within a few days of hatching, and placed them side by side in the open air: the result convinced me that the difference between the temperature of the pipit's egg and that of the cuckoo could not be thus accounted for.

Repeated inquiry among my friends, and also among many scores of birdsnesting boys, have furnished me with several instances of a somewhat similar nature, the tendency of them all being to prove that in most cases a remarkably short interval elapses between the arrival of the cuckoo at the nest and the deposition of the egg. Upon an average this interval may be roughly said to range between half a minute and three minutes; and any one who would assert that during so short a space of time the egg is "laid," in the ordinary acceptation of the term, would be compelled to admit, though obviously upon very unsubstantial grounds, that the cuckoo is endowed with a power of which other birds are destitute; for we must remember that even a barn-door hen, no matter how anxious she may be to lay, is seldom in the nest for less than ten minutes or a quarter of an hour before the egg is produced. I once thought to solve the difficulty by comparing the relative sizes of the eggs and of the parent birds, but herein I failed; for in the cuckoo, although the egg is remarkably small, the reproductive organs are proportionately contracted in their dimensions. Even were the contrary the case, it would be an ingenious cuckoo indeed that could lay a cold egg.

With regard to the instance previously mentioned, in which a female cuckoo, on being shot, dropped an egg upon the ground, another one equally well developed being at the same time within the oviduct, the truth appears self-evident. The egg which fell upon the ground must have been laid some hours previously, and the undigested

state of the food in the stomach afforded ample proof that the bird had recently been feeding, of course without so serious an impediment to deglutition as an egg would have been; it therefore only remains to be decided where the egg was in the meantime. Cases of this kind are usually met by the argument that the bird was not the parent of the egg, but that the latter was in the act of being devoured. Truly it would require a most accommodating imagination on the part of any naturalist who would attribute to this interesting species such a marvellous power of oological discrimination, for how can it be even for one instant supposed that the bird is in the habit of seeking out nests for the purpose of abstracting such eggs as have been laid by its own species? If such really were the case, the habit must belong to the female alone, for I believe I am correct in stating that no instance has yet been recorded of a male cuckoo carrying an egg. Even if all this be admitted, one grave question still remains, *viz.*, by what means does the bird invariably select *fresh* eggs?

It is to be regretted that the shy habits of the cuckoo render the task of becoming acquainted with its history one of such extreme difficulty, and it is only to my good fortune in having resided in neighbourhoods where cuckoos abounded, and perhaps also in no small degree to mere accident, that I attribute my success, comparatively trifling though it has been. Still, I trust that the few facts which I have advanced speak sufficiently for themselves, and that other and more competent observers will ere long be enabled to remove all further doubt upon this much-vexed question.

HENRY L. SAXBY.

H.M.S. 'Devonshire,' Sheerness,
August 1, 1862.

Occurrence of the Norfolk Plover in Cambridgeshire, with a few Remarks upon its Habits.—This species, which, to my knowledge, has never before occurred in any numbers, has this year been very plentiful, as many as two or three dozen eggs having been exposed for sale at one fishmonger's shop in Cambridge, and I have also seen a good number of old birds. A man brought me a nearly full-grown young bird, and had another, which got accidentally killed. I kept my bird alive, and apparently in the enjoyment of good health, for several days, and I think I dare venture to say it would have been easily tamed, or, in other words, quite reconciled to roam about in a moderate-sized enclosure, had it not unfortunately partaken of something in the way of salt meat. It devoured worms, slugs, caterpillars and blowflies; it had a peculiar dexterity in detaching a snail from its outer covering, a shake of its plumage after this feat evidently portraying its satisfaction at its success. To watch its movements, which were of the most active and sprightly kind, afforded me the greatest pleasure:

it was constantly on the move, now and again stopping to pick up a worm or a slug which had incautiously placed itself in its way. Its movements were graceful and quick; it used to run with the neck comparatively short, its eyes ever actively on the alert for some dainty morsel: as the shades of evening drew near, it appeared to move more actively than during the day, if possible searching with renewed vigour: while standing the legs and thighs were very forward; in feeding it only slightly inclined the body forward, and, lowering the neck in a curve, it would make a determined dart at its food; while at rest (which appeared to be only during the hottest part of the day) it squatted flat upon the ground, with head and neck brought close to the shoulders; in running it took long and rapid strides; in walking the feet were carried rather wide, not as in the *Tringa* family, which while walking or running place one foot over the other; the tail, which it kept constantly on the move, was carried rather high; the knees were very swollen (naturally so): it must have been the young of this bird that first led naturalists to apply the appellation of "thick-kneed" plover, as adult birds of this species never present a puffy appearance in their knee-joints.—*S. P. Saville; Dover House, Cambridge, July 13, 1862.*

Snipes' Nests in Oxfordshire.—Several nests of the snipe have been mown out in Mr. Richard Lord's common near Stanton Harcourt, Oxfordshire, and the head of one old bird cut off with the scythe: this is an unusual occurrence, as the snipe was never known to breed in that locality before. I have some of the eggs, sent me by Mr. G. Arnatt, of Stanton Harcourt, a friend of Mr. Lord's.—*W. Hollis; 8, Canonbury Cottages, Lower Road, Islington.*

Unusual Situation of a Sandpiper's Nest.—Some weeks ago, as I was walking by the side of a rough stone wall, about half-a-dozen yards from a small pool of fresh water, a common sandpiper flew out close to my feet; and on stooping down I was surprised to find its nest, containing four eggs, placed upon the ground, and so far back in a crevice that my hand, when inserted up to the wrist, was only just able to reach the eggs. The hollow in which the nest was situated was about an inch and a half deep in the centre, and had probably been excavated by the bird, as the soil was very loose and dry. The lining of the nest consisted of fine dry grass and about thirty white feathers; beneath was a somewhat thick bed of moss and half-dried pond-weed, a considerable mass of which filled up a crevice behind. I have found many nests of the common sandpiper, but never knew one to contain so large a quantity of material, or to be so neatly and compactly made. The very unusual addition of feathers was readily accounted for when I observed the quantity of them lying at the margin of the pool, which was much resorted to by geese. It may be just possible that, the nest having been disturbed by these birds upon former occasions, the poor sandpipers, in the unconscious fulfilment of a well-known adage, "went to the wall" forthwith. It has no doubt been frequently remarked that the common sandpiper, when unmolested, will return to the same spot, year after year, for the purpose of incubation. I remember an old gardener in North Wales showing me a hollow at the foot of a thick bush of yellow broom, and assuring me that a pair of these birds had for many years been in the habit of bringing out their young there; in the following spring I had the satisfaction of seeing the pair return to that very spot, and of watching them from the time they collected the first few dry broom-pods, as the commencement of their nest, until long after the young birds accompanied their parents to the river-side.—*Henry L. Saxby; H.M.S. 'Devonshire,' Sheerness, July 31, 1862.*

Natural History Notes from Norway. — These notes have been kindly forwarded to me by my esteemed friend Mr. Charles Doughty, of Hiberton Hall, Suffolk, who has just returned from Norway. He has been on a tour of geological research, and has devoted some portion of his time in penning these interesting notes. He commences thus:—"The cuckoo I heard in full call at midnight was at Tromsøe, 2° north of the Arctic Circle; it sang at intervals throughout the night. The night hour in these regions, at this season, is merely an arbitrary division of time, as the sun shines throughout the twenty-four hours, diffusing a sensible warmth at midnight at an elevation of rather more than 4° above the horizon. I spent the night upon the Sound shooting, and most beautiful it was, surrounded by snow-peaks, the full globe of the sun shining above them, and the water so clear that I could plainly see shells and other marine productions thirty or forty feet below the surface. Everything was perfectly still, except the occasional notes of the solitary cuckoo from a stunted wood above the town. It was here I shot most of my eiders and the rednecked diver: they are quieter at night, when the sun has less power, and can consequently be more easily approached. The Norwegians call the red and blacknecked divers 'looms.' I saw several altogether, but they are singularly wild and shy, being seldom shot on that account. They fly very high up in the air when going from place to place, making a loud cackling noise not unlike a duck: they rise from the water very awkwardly, running and splashing for at least fifty yards before they are fairly on the wing; then, however, they fly with amazing rapidity. They are very tough birds, and unless struck on the head or wing are seldom brought down. The skua gull I shot at Bodo, a little north of the Arctic Circle. There is a vast morass behind the town, and about six of these birds were coursing and screaming over it; they were very shy, and after many attempts I gave up all hopes of getting within range of any of them. At last I quite lost my way, the town being hidden behind hills, and when wandering hopelessly about I suddenly looked up and saw two sailing over my head. I immediately brought down one of the birds, but the other was too quick for me, and was out of range in a moment. The one I shot was only wounded, and bit at me fiercely as I went to pick it up. By holding it up, when dead, at arm's length, I managed to entice its mate and two or three others nearly within shot: they made great circles round me, uttering, if I remember right, loud cries. Its gizzard was nearly empty; it contained a few minute fish-bones and a small quantity of decomposed or digested matter. Of the eiders which I shot the gizzards of most were comparatively empty, containing the merest traces of shelly matter; whilst the others contained broken fragments of shell-fish in considerable abundance. One I shot apparently in the act of swallowing, as no less than three small mussels were in its throat: its gizzard was swollen to a prodigious size and perfectly hard; on opening it I found an immense mass of shells, for the most part broken up, but many nearly and others quite entire, with the animal still unchanged in them: the shells were almost entirely mussels, with a few like periwinkles; the mussels are of a very small species. In the throat of another I found a crab, about an inch and a half long and one in width; it is not the common British species, but allied to the 'spider crab.' The thing that struck me so much in this was the sagacity of the bird in biting off all the legs before swallowing it! The razorbill I shot a few miles from N. Cape. They congregate about Stappen Island in thousands: when the sound of my gun disturbed them they rose up in ten thousands, screaming and shrieking at a great height above my head, but occasionally darting past almost within arm's reach. I fired about twelve times, and, though each time I

could distinctly see the effects of the shot in staggering and knocking them a little out of their course, I only brought down two. My friend then took the gun, and, though an old sportsman, killed none: it must be a wonderfully tough bird. The parrot-beak bird was there in almost the same abundance, associating and swimming about with the razorbill, but they were much more shy. The wild animals of Norway are the lynx, the glutton, wolf, foxes (red, silver and black), the bear, the elk, rein-deer and red deer, ermine, lemming, otter, beaver (?), &c. The lynx is somewhat rare, and inhabits, I believe, the extreme North. The glutton is not often seen. The wolf is commoner, and much sought for on account of its valuable fur, which is sold to the Russian traders. The following way of capturing them is somewhat amusing:—In the winter they sometimes tie a young pig to the back of their sledge, and then set off across the snow at full gallop; the pig begins to squeal, and the wolves rush out and are easily shot down. But the most tempting bait for these animals is a dog: for dog's flesh they have an irresistible desire, and have been known to snatch a dog from between the knees of travellers when driving in their carriages. Silver and black foxes are rare, and their skins very valuable; the latter is, I believe, chiefly found in the Leyfodens. The Norwegian bear is a small animal; he never hugs, but kills his enemy by ripping him up with one stroke of his paw: the most vital part is a few inches behind the fore shoulder; some sportsmen, however, aim at the neck, to break the vertebrae I suppose. The elk is rare, and found in a rather limited area. The red deer is also uncommon; it inhabits the islands of the west coast. The rein-deer, though shy and difficult of approach, abounds in the mountains in the south part of Norway; in the north they are tame. Ermines are comparatively abundant in the Leyfodens. Lemmings only appear at definite intervals, and then in the most prodigious abundance, swarming in every field. Otters are rare and expensive. Beavers it is thought are extinct, except in one part of Norway, where a gentleman has carefully preserved them on his property. Ptarmigans are prodigiously abundant in some parts; blackcock and capercally are moderately so." I sincerely hope that the insertion of these notes will stimulate tourists to make the valuable acquisition of a notebook to their kit, and communicate their researches to the 'Zoologist.' Funds of interesting and hitherto-undiscovered facts relative to the habits, retreats, &c., of objects of Natural History, would thus be permanently recorded, and present to the future tourist a chart not to be despised. — *S. P. Saville; Dover House, Cambridge, August 14, 1862.*

Unnoticed Character in Succinea Pfeifferi. — Will you allow me to add a postscript to my query about *Succinea Pfeifferi* (Zool. 8138)? After dissecting and examining many specimens under a microscope, I have found that what I must, for want of a better name, call the "upper jaw" (though it seems to be jaw and palate combined), is, in *S. putris*, divided into three teeth, one large projection in the centre and two small ones, one on each side; whereas in *S. Pfeifferi* there is only one tooth-like projection in the centre of the jaw. I have found this to be invariable in very many specimens of both kinds that I have examined this summer; and the fact goes far to convince me that *S. putris* and *S. Pfeifferi* are more distantly connected than some conchologists seem to think. I send you a drawing of each, which will show you my meaning more clearly than words can. They are two out of many I have done under a *camera lucida*. — *Bruce Hutton; Aldershot, August 7, 1862.*

Occurrence of Cyclas pallida in Lancashire.—For the information of conchologists I am happy to record the occurrence of *Cyclas pallida* (of Dr. Gray) in Lancashire. In September, 1861, I unexpectedly turned it up in the Leeds and Liverpool Canal, while dredging for *Pisidium amnicum*, but as yet have been able to get them only very sparingly. The shell is easily recognized, and widely distinct from any of its congeners, and is truly a beautiful addition to the British Cycladidæ. — *R. Wigglesworth; Maudsley Street, Accrington, August 11, 1862.*

A new British Mygale.—I beg to record the discovery of a *Mygale* new to the British Fauna. The *Atypus Sulzeri*, recorded by Leach, has hitherto been the only representative of the Mygalidæ in the British Fauna; and the new species is the *Dysdera erythrina* of Latreille. I took it on the 19th of July last, from a steep sunny clay-bank ill-famed for adders, near Brighton. It is a male, and is still alive and active. I took it in a lump of crumbling clay containing the tube and an egg-bag, the mouth of which is stopped with the carapace of a spider of the same species. The falces act horizontally; the eyes are six, placed on a tubercle and arranged horse-shoe fashion, with the opening in front. This *Mygale* climbs up the side of the bottle when he pleases, and rests for hours, back downwards, on the linen rag covering the mouth of it; and *Dysdera erythrina* is evidently a *Mygale* built for crawling and struggling through the cracks and crevices of loose and dry clay-banks, and for seizing and killing his prey with fangs acting horizontally.—*John Robertson.*

Capture of Charocampa Nerii at Hastings.—A very fine female of this rare *Sphinx* was taken at rest by a labouring man in this town on Saturday, the 2nd instant. It measures 4 inches 4 lines, and is now in my possession.—*Robert Kent; St. Leonard's-Sea, Sussex, August 8, 1862.*

Capture of Sesia Scoliaformis.—Referring to my advertisement which appeared on the wrapper of the 'Zoologist' for this month, I now add that, besides the specimens there named, I took five more of this species in July, in the pupa state, one of which emerged at 8 o'clock A.M. on the 13th, and the last on the 20th, at 6 o'clock P.M.; another was also taken by my son on the 14th, making eight in all. The only one I saw in the act of stretching on the tree was at 10 o'clock A.M. The larva feeds in the trunks of rough-barked birch trees, and before making up eats its way through the thick bark to the surface, and then spins a tough cocoon. I did not find a trace of one in any smooth-barked tree.—*Nicholas Cooke; Spring View, Liscard, Cheshire, August 7, 1862.*

Larva of Orgyia fascelina.—With regard to your paper describing the larva of *Orgyia fascelina* (Zool. 8078), I fear your informant must have paid but little attention to its habits. Instead of the insect laying her eggs on the dwarf willow in August, she deposits them about the end of June or beginning of July; and instead of the young larva hybernating amongst the roots of the plant (which, if they did, would be fatal to their existence), they may be found snugly made up in the forks and branches of the willow, in a thin silken web, with from eight to a dozen dried leaves of the same drawn together around them. I have found in several of these little

snuggeries, during the winter months, as many as three and four larvæ huddled together. I have never succeeded in saving them through the winter, the cause of which I presume is their removal from their native salt air; nor do they do well unless taken when nearly full-grown. I have sent larvæ to gentlemen in most parts of the country, and have afterwards been informed that they did not thrive. I have paid much attention to this larva, having bred it for the last five years.—*Thomas Galliers; 9, Brenton Street, Liverpool, July 18, 1862.*

[Another and far more important error on my part appears to have escaped my correspondent's notice: the eggs are not deposited on the leaves but on the stems of the willow, and in a very singular manner, which I shall have to describe when printing my collected observations. The laying of the eggs on the leaves was a deviation from normal habit, and probably the result of confinement.—*Edward Newman.*]

Description of the Larva of Ennomos erosaria.—The eggs were laid on the 29th of August, and hatched about the 12th of May. The young larva is almost smooth, but begins to assume the lumps I have to describe after the second ecdysis. The posture in which it rests is varied; I have not unfrequently observed it attached to the twigs of the beech, both by its legs and claspers, the middle of the body being then elevated in an almost semicircular arch; again, not unfrequently it will release the hold of its legs, and adhere only by the claspers; if touched, breathed on or annoyed when in this position, it invariably oscillates the fore part of its body; but no annoyance that I have tried induces this larva to fall off its food-plant or feign death. The head is nearly of the same width as the anterior part of the body, semiporrected, and wider at the mouth than on the crown. The body is narrower anteriorly than posteriorly; and bears a number of wart-like protuberances—one on each side of the 3rd segment; one on each side of the 6th segment, and an elevated ridge on the back between them; a double or compound lump on each side of the 7th segment, extending to the ventral surface of the segment; a large transverse lump on the back of the 9th segment; on the back of the 10th segment are two small warts; on the back of the 12th segment is a transversely-placed lump, and on this lump are two conspicuous warts, also placed transversely; on the 13th segment, below the anal flap, are two parallel approximate points directed backwards: in addition to these lumps, there are a great number of small warts on different parts of the back, and every wart emits a short black bristle. Head pale brown, a crescent-shaped white mark on each lobe of the crown, and a continuous white line across the face just above the mouth; colour of the body dingy brown, in some specimens very pale, approaching to putty-colour; the lumps are darker, and the ventral surface is paler, in some specimens greenish white. There are many shades and variations of colour in different specimens, but they do not appear to me sufficiently constant to demand notice. This larva has a great propensity to spin, constantly drawing the leaves of its food-plant together, as if about to undergo its transformation. Feeds on *Fagus sylvestris* (beech), and is full fed the beginning of July, when it ascends to the top of the cage, and spins a few threads among the leaves, like strong spiders' webs; among these it changes to a pupa: the pupæ are of a pale brown-colour, mottled and reticulated with still paler, and exhibiting darker lines at the junction of the segments and at the margins of the antennæ and wing-cases: they appear remarkably active, and wriggled out of their insecure dwellings on being touched. The moths appeared from the 24th to the 28th of July. I am indebted to Mr. Wright for the opportunity of describing this species, and can only notice its habits and food in confinement.—*Edward Newman.*

Description of the Larva of Eupithecia viminata.—Rather short, but tapering very considerably towards the head. Ground colour bright green, very translucent. Central, dorsal and subdorsal lines dark green, but varying considerably in breadth and intensity of colour. Segmental divisions yellow. Belly generally destitute of markings, but occasionally traversed longitudinally by two slender faint subventral lines, rather darker than the ground colour. Spiracular line whitish green. When young the ground colour is greenish white. Feeds on flowers and seeds of *Valeriana officinalis*, in woods, osier-beds, &c. Full fed from the middle of July to the middle of August. Pupa yellowish olive, enclosed in a slight earthen cocoon. Perfect insect appears in May and June. In July, 1861, I found a number of larvæ feeding upon valerian in one of our Buckinghamshire woods, which I took to be *E. plumbeolata*. The greater part of them were ichneumonid; but in May I bred a small set of *E. viminata*, *Doubl.* I have this summer again met with the larva in an osier-bed in Herefordshire, and in woods in Dorsetshire and Bucks; and my friends Messrs. Hellins and Greene have taken it in Derbyshire and Devonshire. Mr. Doubleday is of opinion—and I have no doubt whatever that he is correct—that this species is *E. valerianata* of Hübner. His figure of the larva of this latter species agrees with those I have taken. The name “*viminata*” must therefore, I suppose, sink, and be replaced by the older and more appropriate title of “*valerianata*.”—*H. Harpur Crewe; The Rectory, Drayton-Beauchamp, Tring, August 12, 1862.*

Description of the Larva of Eupithecia indigata.—Long, slender, and tapering considerably towards the head. Ground colour pale greenish yellow or yellowish red. Central dorsal line dusky reddish brown or olive, frequently very indistinct or wholly evanescent, except on the capital segments. Subdorsal lines pale yellow. Segmental divisions reddish. Head reddish. Collar reddish brown. Spiracular line pale yellow. Belly greenish yellow. Central ventral line yellow. Subventral line reddish brown. The eggs from which the larvæ above detailed were reared were laid by females obligingly sent me by Mr. Greening, of Warrington. They fed upon wild juniper and cypress, and were full fed from the middle to the end of July. I regret to say that just as they were ready to spin up I was obliged to leave home, and the journey killed them all. I was, however, able to take descriptions, and to secure an accurate drawing from the pencil of Mr. Bückler.—*Id.*

Description of the Larva of Petasia nubeculosa.—The egg is laid about the middle of April, either on the slender twigs or young leaves of the birch, and is hatched on or about the 1st of May. The larva rests in the form of a horse-shoe, the head thrown back until it nearly touches the elevation on the 12th segment; when in this position it often adheres by three pairs of claspers, only the 1st and 5th pairs being raised: it does not fall off its food, feign death, or roll itself in a ring when touched or disturbed. The head is of slightly less diameter than the body, and is susceptible of being partially withdrawn into the 2nd segment: the body is of uniform diameter throughout, the 12th segment being elevated on the back into an obtuse angle; the divisions of the segments are marked by conspicuous incisions. Head shining, glaucous or blue: body delicate apple-green, with a narrow, transverse, oblique, yellow stripe on each side of the 4th segment; on the back of each segment from the 5th to the 10th, both inclusive, is a whitish cloud, and on each side of each segment is a faint indication of a similar whitish cloud; on the summit of the elevation on the 12th segment is a narrow transverse line, bright yellow at both extremities, but paler in the middle; on each side of each segment are ten raised dots; the two that most nearly approach the

median line of the back are yellow, and each emits a single black bristle; then follows a longitudinal series of three white dots, and then a single yellow dot emitting a black bristle, and below this yellow dot is a spiracle, oblong, white, and black-margined; anterior to the spiracle and in a line therewith are two white dots, and posterior to these one yellow dot emitting a black bristle and one white dot; behind the last spiracle, and extending along the edge of the anal flap, is a bent white line, in which are two conspicuous yellow dots, larger than either of those previously mentioned: the legs are rather long, green tinged with red-brown; the claspers apple-green, with a shield-shaped mark in black outline on each. Feeds on *Betula alba* (birch), and is full fed rather before the middle of June, when it measures rather more than two inches in length; it then goes into the earth, concealing itself just beneath the surface: the perfect insect appears at the end of March or the beginning of April, and, as far as the British Isles are concerned, has hitherto been found only in Scotland. I am indebted to Mr. Greening, of Warrington, for the opportunity of describing the larva of this species: in confinement it rarely attains the perfect state, most commonly dying as soon as full fed.—*Edward Newman*.

Capture of Heliothis peltigera. — Perhaps it may be interesting to your readers to hear that I have captured, during the last three weeks, three beautiful specimens of *Heliothis peltigera*. Mr. Terry has also captured others in first-rate condition. Among my other best captures this year I may mention—one *Deilephila Livornica*, several *Agrotis lunigera*, and about a dozen *Dianthecia conspersa*. I have also taken two beautiful *Heliothis marginata*.—*R. M. Steward*.

Life-Histories of Sawflies. Translated from the Dutch of M. SNELLEN VAN VOLLENHOVEN, by J. W. MAY, Esq.

(Continued from p. 8083.)

NEMATUS SEPTENTRIONALIS, Linn. *Linn. Faun. Suec.* ed. 2, No. 1558. *Fabr. Syst. Piez.* p. 42, No. 63. *Panzer, Fauna Germ.* 64, f. 11. *Schæffer, Icon.* tab. 167, f. 5, 6. *DeGeer, Mém.* ii. 2, p. 262 (*Goetze*), tab. 37, fig. 24—28. *Ratzeburg, Forstins.* iii. p. 118, tab. 3, fig. 3. *Lepelletier, Monogr.* p. 63, No. 184. *Curtis, British Ent.* i. pl. 17.

Nematus niger, ore pedibusque anticis partim luteo-rufis, abdominis fascia lata rufa, tarsorum posticorum articulo primo latissimo compressoque.

After the careful researches of Ratzeburg, there remains but little new or unknown to record concerning this insect; but as this author does not mention the points in which the young larvæ differ from the full-grown, we hope our descriptions and figure will not be looked upon as wholly uncalled for.

The imagoes are found in May and June (fig. 6 represents a female,

magnified). As Ratzeburg justly remarks, Dr. Hartig, in his *Aderfl. Deutschl. i. p.* 184 and following pages, has not described the true *N. septentrionalis*, *Linn.*, as according to him, the female has red femora. The imago is from 9 to 10 mm. long, expanding to from 12 to 13 mm. In the female the head and antennæ, together with the breast and base and apex of the abdomen, are black; the mouth is brownish and the cenchri white. Coxæ black, but the ends of those of the third pair and the apophyses are obscure white; femora black, those of the first pair inclining to brown; the tibiæ and tarsi of the first and second pairs reddish brown, the tibiæ with white rings at the base; the femora of the posterior pair are black, the tibiæ white, the end, which is black, being flattened and expanded, spines red, tarsi black, the first joint being also broad and expanded. The second and succeeding segments of the abdomen up to the sixth are red; the first has usually a narrow, red, transverse line on the anterior margin. The wings are transparent, with a brown stigma; costal nervures brown, with a smoke-coloured band extending downwards from the stigma, and faintly continued to the apical margin. The posterior wings are also clouded between the anterior and apical margins (fig. 6).

The male is distinguished by a more elongated form of abdomen; the mouth is obscure brown, as are also the tegulæ and the antennæ (the latter sometimes only on the under side, or for half their length). In this sex the legs are almost entirely reddish brown, as only the coxæ for four-fifths of their length, the trochanters and apophyses of the anterior and intermediate pairs of legs, as also the ends of the femora, the apices of the tibiæ, and the tarsi of the posterior pair of legs are black.

These insects saw an opening in the veins of the leaves of the alder, and deposit as many as 150 eggs in rows. According to Ratzeburg the larvæ are also found on the birch, the broad-leaved willow, the wild cherry, the hazel, and the balsam-poplar; like DeGeer, I have only found them in this country on the alder, sometimes in such numbers that the whole tree was stripped of its leaves; thus in 1841 solitary alders growing between Bodegraven and Sluipwijk, and rows of the same tree thickly planted along the banks of the canal near the Hague, were completely stripped of their leaves.

At the time of quitting the egg the larva is white, with a brown head, but by the following day has acquired a green colour. They begin by eating out holes in the middle of the leaves. After the second moult they are obscure green or pale brown, both extremities being somewhat yellow, with two black stripes on either side; the

posterior extremity is somewhat attenuated, the head shining black (fig. 1).

When fully grown the larva is about 14 mm. long (see fig. 2); it has 20 legs, colour greenish or bluish green, the first and last segments, together with the abdominal claspers, inclining to orange; head shining, deep black; the under lip and maxillary palpi obscure gray and black-ringed. The head is provided with some extremely minute hairs. The first segment is orange-yellow, with a very small black spot on each side; the second is yellowish gray, the third to the eleventh greenish gray, the twelfth and thirteenth yellow. There is an irregular black spot on each side above the scarcely visible white spiracles; below the spiracles one larger and two smaller vertical black shining spots; below these, again, at the origin of the legs, a single black shining spot. On the first segment below the spiracle are some irregular black lines or spots; on the third and fourth, just above the legs, are a square spot and some little lines. On the last segment, above the anus, is a triangular black spot, branching out on either side into a sharp point, as represented, magnified, at fig. 4. The thoracic legs are shining gray, with a brown point on the last joint, and brown claws. The middle and hinder legs are deep yellow. On the under side, between each pair of these legs, is a triangular black spot, and before it, in the direction of the head, a small line. There is a large gland behind the first spot on the fifth, sixth, seventh, eighth and ninth segments, represented at fig. 3, *a* and *b*; on the fourth and tenth is a very small gland. These glands seem to be covered with little wart-like protuberances, in the same manner as the first toes of the fore feet of the male frog in the pairing season; they are drawn back into themselves like the finger of a glove or the horns of a snail. I have not been able to perceive any opening at the end, not even when I had expanded the gland to its utmost by compression. As in this operation the skin falls into transverse wrinkles, one may readily, at first sight, imagine that a transverse opening exists.

After the second moult the larvæ consume the leaf, beginning at the edge and usually leaving nothing but the larger veins. At the slightest touch, either from others or from their companions, they raise the abdomen, and bend it over sometimes as far as the head, thereby causing the opening of the abdominal ducts. These probably emit a fluid which is hurtful or obnoxious to the enemies of the larva, particularly the parasitic ichneumons. When the time for pupizing has arrived, usually four weeks after the larva has quitted the egg, it

lets itself fall to the ground, and, after having crawled about for some time, spins itself an oval cocoon, covered on the outside with little grains of earth, being black and smooth on the inside. The larva generally remains one year in the cocoon before changing to the pupa; some individuals, however, assume the pupa state within eight months, and emerge in May. From this we should be led to suppose there are two generations in the year; however, I have never found the larva earlier than August, and find no record of larvæ in May and June. The pupa is represented at fig. 5. The imago gnaws its way out by an oblique irregular opening in the cocoon.

The National Museum of Natural History has two specimens of the female, from my collection, both of which have only three submarginal cells in the right fore wing, the second submarginal being united to the third, in consequence of the absence of the middle transverse nervure. *Nematus latipes*, described as a distinct species by Foulques de Villaret in the 'Annales de la Société Entomologique de France,' is only a variety of this species. Probably his *Nematus varus* and *N. laticrus* are also only varieties of *N. septentrionalis*. We must, however, not omit to mention that Ratzeburg considers *Nematus varus* to be distinct, for the two following reasons:—first, there is a difference between the imagos, not only in colour but also in structure; for example, in the form of the hinder tibiæ, which are not so suddenly nor so much expanded towards the end: and secondly, there is a great difference in the colour of the larva, which appears to want the orange tinge, and seems to be entirely green, with black spots on the sides. He also includes the sawfly described by DeGeer; but in this he is certainly in error, for DeGeer distinctly states that his larvæ had the first and last segments of the body yellow, inclining to orange. So far as we know there seems to be no reason why we should not regard the four species as one.*

I have not reared any parasitic wasps from the larvæ of this species. Ratzeburg, in his 'Ichneumonien der Forst-Insecten,' records no less than nine species of Ichneumonidæ and Braconidæ, which were reared in Germany from *Nematus septentrionalis*.

* Since the above was published in the original, the following has been received from the author:—

"I have lately discovered that Ratzeburg was quite right in his assertion that *Nematus varus* is a distinct species. I have reared this latter insect from the larva, which is in fact entirely green, with black spots."

Capture of Toxocampa Craccæ in Devonshire. — I took four specimens of *Toxocampa Craccæ* in the perfect state, on the north coast of Devon, July 24—28, 1861. This spring I wrote to a friend of mine, whose family are fond of Natural History, to get them to search for the larva on *Vicia sylvatica*, which grows abundantly in the locality. I received in due time a box with a broken lid, containing only food, the three larvæ which had been put in having found their way out. Afterwards I received another box containing two larvæ, one lively and nearly full-grown, the other smaller and quite dead, and one pupa. The following is an accurate description of the larva, taken from my journal: — "Date when received, June 7th. Food-plant, *Vicia sylvatica*. Legs 16, half-looper, long, rather attenuated towards extremities. Dorsal band broad, dark olive, intersected by a thin dorsal line, and containing on each segment four indistinct blackish spots, two on each side of the line. The lateral spaces, from the dorsal band to below the spiracles, are yellowish olive, containing, first, a very narrow dark line from head to tail; secondly, a cloudy broader line or band enclosing the spiracles (blackish rings indistinct), and two small black spots on each segment, placed obliquely on each side the spiracles, the upper one towards the head. The whole of the under side is dark olive, as dark as the dorsal band, darkest next to the lighter lateral spaces, streaked with lighter olive and intersected by a dark ventral line. Head pale olive, with the darker lines of the body going through it." My larva fed on *Vicia sylvatica* as long as the supply sent with it lasted; when this failed, and I was expecting every day to see it change to a pupa, I tried it with every kind of leguminous plant that I could obtain from a neighbouring nursery, but in vain; and as I could not procure its proper food in time, it died. My Devonshire friend had before tried them on *Vicia Cracca*, but they would not touch it. My only hope now was in the pupa which I received in the same box with the larva, and which was alive when it arrived. As it was not in a cocoon, I thought it best to put it on earth in a pot and cover it with moss. The result I have already stated; but from my having taken the imago in fine condition on July 24th, and received a pupa on June 7th, it appears that the pupa state lasts about six weeks. There is no doubt in my mind of the larva being that of *T. Craccæ*; it is not that of *T. pastinum*, as it is a half-looper, and as it was taken feeding where the imago was taken the year before. I will here give an extract from my friend's daughter's letter who found the larvæ, partly because it throws light on the habits of the insect, and partly because it proves that the pupa sent me was that of the same kind of larva: — "I am very glad you think it the right caterpillar, and I shall be very glad to give you any information I can about it. The first boxful I sent you were very small, smaller than the little one (the dead one) you had last time: they were exactly the same colour as the larger, only perhaps a little lighter. I found them all on the stalk of the plant, and generally crawling up it. I have seen two or three since, besides the ones I sent you; but they are very difficult to get. The moment you touch them they wriggle up and fall off, and unless you have something underneath to catch them in they are lost in the grass. The chrysalis turned after I picked up the caterpillar. One morning when I looked at it, it seemed stupid and sleepy, and I thought it was going to change its skin. Next time I looked it was a chrysalis: it had no cocoon. I found all of them close to where we used to catch the moth, never higher up nor lower down, though the plant was more plentiful then." I could have got more larvæ I have no doubt; but I told my friend not to take any more, for fear of destroying the species. Mr. Stainton exhibited a specimen of the perfect insect at a meeting of the London

Entomological Society (Zool. 7981), but I here add a description of it, for the benefit of those who were not at the meeting, as well as a description of the pupa:—

Imago. Expanse of wings rather greater than in *T. pastinum*. Body much stouter. Ground colour the same. Collar jet-black. Transverse streaks nearly or quite absent. Reniform stigma a regular crescent, brown, edged towards the base with black; whereas in *T. pastinum* it comes to an angle, and the brown filling up is wanting. Four brown-black spots on the costa, preceding the brown triangular cloud, the one close to the base the smallest. The veins of the upper wings are all whitish, while in *T. pastinum* they are not distinguished from the ground colour.

Pupa. Entirely dark brown, inclining to black; wing-cases not produced to a point. Anal segment terminated by a bunch of short spines, with fine recurved points.—*E. Horton; Lower Wick, Worcester, August 23, 1862.*

Larvæ of the Glowworm.—Last spring I took three larvæ of the glowworm (*Lampyrus noctiluca*) in the Isle of Wight. In course of time they turned to pupæ, and I could not help noticing how prominent the distinction of sex was in this stage. One was evidently destined to produce a male, and the rudiments of the wings were very visible; the other two were larger, and without the smallest trace of wings: these, as was expected, turned out females. All three pupæ were luminous, the light being similar in character to that of the perfect male, namely, two small round spots of greenish light on the under side of the abdomen near the extremity: the light was only shown when the pupæ were disturbed. When the perfect insects appeared, a pair were placed in a phial with damp moss. Union lasted more than four hours, but less than eight; and the next day the female commenced laying eggs, and in two or three days they amounted to about 120. They seemed fragile and of a yellowish colour, not much unlike the seeds in the pulp of a grocer's fig. When magnified about a hundred diameters the surface was seen to be obscurely and minutely granulated. On taking the phial into a dark room the eggs were found to be distinctly luminous, the minute globes of light pointing out the position of each individual egg among the moss. The light of the eggs was of course persistent, not requiring the stimulus of irritation. One that happened to get crushed smeared its luminous matter on the finger. On the eighth day after the laying commenced both seemed to be dead, but the male revived on being disturbed, and made some efforts to crawl, showing the usual two points of light when touched. The female could not be made to show any sign of life, but the body was quite flaccid, and when examined in the dark the penultimate segment was plainly luminous, and the antepenultimate very obscurely so; not the slightest movement could be detected with a lens, though disturbed. After another day or so the whole abdomen was faintly luminous from end to end, the divisions of the segments being visible in the dark. The body was then limp from incipient decomposition; so perhaps the light might be analogous to the gleam of a decaying lobster. These observations satisfied me that the glowworm is luminous in all the stages of both sexes—egg, larva, pupa and imago. The separated female, like the male, lived but a short time longer.—*George Guyon.*

Cicada hæmatodes.—In 1859 I took a specimen of the above (now in the collection of Prof. Babington) in the New Forest; it was sitting on the stem of the common brake (*Pteris aquilina*), and on my endeavouring to catch it it flew off with a loud buzzing noise. On the 29th of last month (June) I took two more; both were sitting on the stems of the brake, and flew off in the same manner as the one referred to, only to become victims of the net and pin. At the same time I heard two more,—

"Drunk with the dewdrop, perched on twig so lofty,
Noisy Cicada, o'er the wild waste sounding,
Sawlike the feet which to thy side thou presseth,
Drawing sweet music,"—

but did not succeed in getting either of them. On several succeeding days I heard some singing, but they were still

"Perched on lofty branches,
Deep in the forest," &c.

—W. Farren.

Proceedings of Societies.

ENTOMOLOGICAL SOCIETY.

August 4, 1862.—FREDERICK SMITH, Esq., President, in the chair.

On the motion of the Rev. Hamlet Clark, seconded by Prof. Westwood, it was unanimously resolved, "That the thanks of the Society be tendered to W. Wilson Saunders, Esq., for his constant liberality towards the Society, and in particular for the hospitality exhibited by him on the occasion of the Society's visit to Reigate on the 8th ult."

Donations.

The following donations were announced, and thanks ordered to be given to the respective donors:—'Proceedings of the Royal Society,' Vol. xii. No. 50; presented by the Society. 'The Zoologist' for August; by the Editor. 'The Intellectual Observer' for August; by the Publishers, Messrs. Groombridge & Sons. 'Saggio di Ditterologia Messicana di Luigi Bellardi, Professore di Storia Naturale,' Parte II., ed Appendice; by the Author. 'Journal of the Society of Arts' for July; by the Society. 'The London Review' for July; by the Editor. 'The Athenæum' for July; by the Editor. 'On the opportunities of advancing Science enjoyed by the Mercantile Marine,' by Cuthbert Collingwood, M.B., F.L.S., &c.; by the Author. 'Stettiner Entomologische Zeitung,' 1862, Nos. 4—6; by the Entomological Society of Stettin.

Exhibitions, &c.

Mr. Stevens exhibited a magnificent collection of Coleoptera, made by the late M. Mouhot among the mountains of Lao, in the interior of Cochin-China; it included some splendid Buprestidæ, about 150 species of Longicorns, &c., and a very large number of novelties. He regretted to have to state that M. Mouhot's exertions in the cause of Science had brought on a fever which resulted in his death.

Mr. Stainton exhibited specimens of *Gracilaria semifascia*, bred from maple-leaves obtained near Mickleham, on which the larvæ raised small, blunt, conical excrescences. Mr. Stainton having remarked upon the tendency of this insect to produce verdigris on the pin, the President suggested the use of a pin dipped into varnish, and allowed to dry before it was used.

Mr. Wallace exhibited photographic figures of Coleoptera: plates of Lucani, of the natural size, were conspicuously successful; other insects of smaller size, but magnified twice in linear dimensions, were not so successful. Mr. Wallace called

attention to the mode of mounting these smaller species on pieces of gelatine instead of cardboard: this rendered the use of gum unnecessary, since all that was requisite to fix the insect was to moisten the under side; moreover, the gelatine was so transparent that the under side of the insect was available for examination.

The President exhibited two rare Staphylinidæ, — *Myrmedonia Haworthii* and *Heliobates propinqua*, — both captured by his son, Mr. Edward Smith, on Reigate Common, on the occasion of the Society's excursion on the 8th ultimo.

The President also exhibited an imperfect hermaphrodite of *Apis mellifica*, which had been sent from Scotland, and read the following description thereof:—

"Size and general appearance of the insect that of a worker. Head male; the eyes large, and meeting on the vertex; both the antennæ female, 12-jointed. Mandibles worker, not toothed at the apex as in both male and female. Wing on the right side, male; that on the left, worker. Legs male, or rather, partly male on the right side; the anterior and intermediate legs perfect male; the posterior leg male, but fringed with hair, and the basal joint of the tarsus male exteriorly, that is, smooth and convex, but within transversely ridged and clothed with hair; the following joints male; the left posterior leg is perfect worker. The abdomen furnished with a sting; the sting female, straight."

Prof. Westwood said that during June last he had noticed a couple of hive-bees near the mouth of the hive, apparently fighting; and on capturing them he found that one, which seemed to have been attacked by the other, had attached to its head a tuft of filamentous matter, which turned out to be composed of the pollen-matter of *Orchis maculata*. The Professor was desirous of sending the specimen to Mr. Darwin, as bearing on the subject treated in the most recent of that gentleman's works, but unfortunately it had been placed in spirit, by which the tuft of pollen-matter had been dissolved.

The Secretary read, on behalf of Dr. Alexander Wallace, the following

Note on the Ravages of the (Currant) Sawfly.

"In the 'Zoologist' for July, 1862 (Zool. 8079), an interesting account is given of the sawfly, *Nematus ventricosus*, *Klug*, translated from the Dutch of M. Snellen van Vollenhoven, by J. W. May, Esq. This insect is familiarly known by the name of the 'gooseberry grub,' whose ravages this year, extending all over the kingdom, have deprived us of many tons of fruit. By studying the natural history of this and other insects, we shall doubtless find a clue to the prevention of their ravages, and I wish now to throw out some hints which may prove useful for that purpose. After giving a description of the larvæ, &c., our author goes on to state, 'They feed both day and night, and, beginning in company on a leaf, they eat on until there is nothing left but the stalk and some of the thickest veins. Before quitting the bush they moult, once more assuming a pale yellowish green colour, the first and terminal segments being orange; but they are now without the black spots and hairs which they had in their earlier state. After this they drop from the tree, and construct a cocoon at the foot: this cocoon is made at no great depth in the ground, and is externally covered with little grains of earth. They assume the pupa state, in the summer, in the space of three weeks, in the winter only after an interval of eight months. The pupæ are yellowish white, and display all the parts of the imago. They very soon change their colour, and in eight or ten days, having moulted for the last time,

the perfect insect gnaws open the cocoon and escapes.' Our author then gives a description of the perfect insect, and further adds, 'There was an incredible number of these larvæ in 1860. From observations made at Utrecht and at Leyden, there seems no doubt that the first brood in May attacked exclusively the leaves of the gooseberry, some of the bushes being quite stripped; and that the second generation, appearing in July, principally confined itself to the currant, but small numbers having been seen on the gooseberry. I observed this myself in a garden where the two plants were growing intermixed. Both larvæ and imago were decidedly of but one species.' The truth of this latter observation, that the larvæ attack both gooseberry and currant trees (the former at an earlier period of the year), is quite borne out by my own observation this summer. The second brood having now just made their appearance, I will detail a mode by which their ravages may be greatly lessened.

"The eggs—white, elliptical—are laid on the under surface, along the ribs of the leaf, to the number sometimes of 120 on a single leaf; the larvæ, when hatched, during the first twenty-four hours, make each one a little round hole. The leaf then presents the appearance of having been riddled by No. 7 shot. The second day the holes are larger, less regular, and soon coalescing; the larger veins only at the tip of the leaf remain undemolished. This is the critical time to destroy the brood. By gathering these leaves daily as the caterpillars are hatched (for they keep coming out during a fortnight or three weeks, according to the period at which the eggs were laid) the whole of the brood will be easily destroyed. The peculiar appearance of the leaf renders the gathering of the brood remarkably easy; while the fact that at this early period they are all together on one leaf, and that a week later they will be more scattered over the tree, as also that their destruction of the foliage is then at the minimum, peculiarly points out this period as the one most suitable to their destruction. I should say that on the 19th of July, from about ten trees in my own garden, I picked off fifty to seventy leaves, each containing from five to seventy eggs, and young larvæ just hatched. Since then I have daily picked off about ten leaves similarly attacked. If each possessor of a garden would thus destroy the young brood, we should have no more sawflies next year to trouble us. Other methods are advantageously used at a later period for their destruction; such are hand-picking, shaking the stems, when the larvæ drop down and can be killed; syringing the under surface of the leaves with alum and water, or watering the larvæ when shaken down with the same mixture: but all these methods are put in force when the damage is half done and when the larvæ are widely distributed over the trees, and are insignificant when compared with that which I now advocate for nipping the evil in the bud. Let us now look to our currant trees and next spring to our gooseberry trees, and we shall get rid of the enemy."

Paper read.

The President read a paper entitled "A List of the Genera and Species belonging to the Family Cryptoceridæ, with Descriptions of New Species."—J. W. D.

A Visit to Pratas Island.—In the 'Zoologist' for 1860 (Zool. 7236) I contributed a list of animals observed on Pratas Island, situated at one side of the Pratas Reef, a coral formation in the China Sea. Since then I have come across a short account of

my visit to the Pratas Shoal, which possibly may interest some of your readers, as conveying some notion of what these isolated coral islands are like. During our trip to the Reef, in the 'Dove,' April 20th, 1858, about one hundred miles from Hong Kong, a padi-bird is observed on the wing, making futile attempts to get on board. This is so far interesting, as tending to confirm the idea that, after the web-footed aquatic birds, like the albatrosses, gulls and gannets, the wading birds form the earliest colonists of oceanic atolls and other islets. When I land on the island, through the surf, like Robinson Crusoe, I light a fire and make a tent of the boat's sail, choosing for my bivouac a little sheltered glen, with bushes of *Scaviola* on one side and stunted *Tournefortia* trees on the other. Having arranged the house to my satisfaction, I walk round the island. Near the sea I observe a carpet of creeping grass, the flowers with large white anthers, and bearing a delicate feathery stigma, and gemmed all over with *Convolvulus* flowers—red, white and pink. At the first blush nothing was visible inland but dense masses of green glaucous shrubs, mostly *Scaviola*, with here and there traces of *Tournefortia*. As I advance, however, I see open spaces, with heaps of fine coral sand, white as the driven snow. The bones of shipwrecked men, mingled with those of the turtle on which they had fed, are bleaching in the sun. The heat is intense, and, with dozens of gannets hovering over my head, I bathe in the view of the shoreless ocean. So bold grow the gannets as to threaten my eyes, and I leave the water to pelt them with fragments of coral, for stones there are none. The fin of a shark looks rather ominous of evil, so I dress and proceed with my exploration. I capture a white heron, with a crest of two long feathers; I then rob a gannet's nest of two light green eggs, about as large as those of a duck; I come to a little joss-house filled with offerings to the Chinese goddess of the sea; looking for beetles in the undergrowth, I am stung by a little scorpion: I observe, moreover, that *Oecypode*, or horsemen crabs, run about the sand; that a huge locust everywhere leaps about, and that a splendid humming-bird hawk-moth hovers incessantly about the white, fissured flowers of the *Scaviola* lobelia. On the outskirts of the liliputian jungle are carpets of crassulaceous plants, in which the land-crabs, *Thelphusa* and *Oecypode*, form large, deep burrows. I now come to a double lagoon, divided by a tongue of land, and near the end of which *Pandanus* and other trees form quite a miniature picture of a tropical forest. Madrepore masses, left high and dry, fringe one margin of the lagoon; hermit-crabs abound; and among the herbage I notice rounded masses of pumice-stone, which must have been floated hither by currents from Formosa, for I cannot discover any traces of a volcanic origin for my little island. In fact it appears to be merely one end of the horse-shoe coral reef the 'Dove' is now surveying, elevated above the level of the sea and covered with vegetation. Wading birds are seen fishing in the waters of the shallow lagoon, sandpipers on the yielding sands, snipes on the soft, oozy ground of the margin, and herons standing in the water. The number of gannets on the island is astounding; the ground in some parts is strewn with their eggs, two in each shallow nest of sticks, and often, instead of eggs, two callow unfledged young ones. The contents of their pelican pouch I observe to be chiefly flying fish, the flavour of which the infant gannets appear to fully appreciate.

Arthur Adams.

Woodcock breeding near Keswick, Cumberland.—My brother, J. S. Mawson, when out in search of insects on the 24th of June, nearly stepped upon the nest of a woodcock, containing four eggs: the old bird was rising from the nest at the time. My brother continued to visit the nest daily up to the time she hatched, which was on the 7th of July: the old bird allowed him to go within a couple of yards of the nest without being in the least annoyed. The nest is merely a slight hollow in the ground, with a few dry leaves round the sides. The old bird, when sitting upon the nest, always rests the point of its beak upon the ground, with its dumpty tail almost erect, giving it a curious appearance. The nest is upon a dry bank facing the North, which I believe is nearly always the case with the woodcock, the bird preferring the shady to the sunny side of a bank. The eggs are very similar to those of the corn crane, being rather larger and in colour much the same. After hatching, the young birds left the nest almost immediately.—*George Mawson; Gill House, August 18, 1862.*

Eupithecia debiliata.—I have great pleasure in adding to the testimony of the Rev. E. Horton (Zool. 7969) concerning the food-plant of the larva of this insect; for although I have taken a good number of the insect this season, yet in no single instance did I take one where *Vaccinium Myrtillus* did not grow. I have also taken the insect on *Chat Moss*, on a spot where *Vaccinium Myrtillus* was growing.—*Charles Campbell; 325, Rochdale Road, Manchester, August 25, 1862.*

TO LONDON ENTOMOLOGISTS.—I have a number of good Specimens of *Nyssia zonaria* for exchange; also from three to eight pairs of the following, as numbered in the Appendix to Stainton's 'Manual,' viz., 57, 78, 114, 145, 168, 173, 253, 279, 305, 318, 332, 342, 348, 366, 367, 412, 431, 486, and about 250 Specimens of other Species. *Desiderata*—Local Species in British Sphingina, Bombycina and Noctuidina. I purpose delivering the exchange personally, when in the metropolis this month. Those correspondents not hearing from me within ten days will conclude their offers are not wanted.

THOMAS GALLIERS, 9, Brenton Street, Liverpool.

PUPA DIGGING.

A SECOND and greatly improved Edition of the Rev. JOSEPH GREENE's 'Pupa Digging' is in course of preparation: the new matter will comprise General Instructions for Collecting and Preserving Insects, a great desideratum in Entomology. Price and other particulars will be announced in a short time. The work will be a kind of *multum in parvo*, the 'Insect Hunters' indispensable *vade-mecum*.

Edward Newman, 9, Devonshire Street, Bishopsgate.

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